

FINAL REPORT

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"

Dr.Rattanawan Mungkung et al.

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FINAL REPORT

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"

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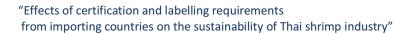
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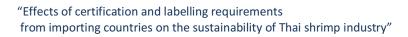
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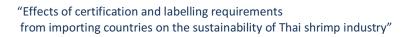


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บทคัดย่อ

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ระบบรับรองถูกนำมาใช้ในการเพาะเลี้ยงกุ้ง เพื่อเป็นเครื่องมือสื่อสารข้อมูลคุณลักษณะของผลิตภัณฑ์กุ้ง ระหว่างผู้ผลิตและผู้บริโภค โดยมีความคาดหวังว่าระบบรับรองจะเป็นกลไกกระตุ้นให้เกิดการผลิตและ บริโภคอย่างมีจริยธรรม มีความรับผิดชอบต่อสิ่งแวดล้อมและสังคม ตลอดจนส่งเสริมการพัฒนาอย่าง ยั่งยืน ในปัจจุบันมีการพัฒนาระบบรับรองอย่างต่อเนื่อง โดยที่ยังไม่ทราบแน่ชัดถึงผลของระบบรับรองที่ มีอยู่ต่อการพัฒนาอย่างยั่งยืน ทำให้นำไปสู่การประเมินผลเชิงสิ่งแวดล้อม สังคม และเศรษฐศาสตร์ ของ ระบบรับรองกุ้งที่ปฏิบัติในประเทศ โดยอาศัยแนวคิดเชิงระบบประกอบกับการวิเคราะห์หลักการบริหาร จัดการและวิเคราะห์ผู้ที่มีส่วนได้ส่วนเสีย ซึ่งรวบรวมข้อมูลในภาคสนามด้วยแบบสอบถามฟาร์มและโรง เพาะฟัก จำนวน 234 ตัวอย่าง และการสัมภาษณ์เชิงลึกผู้ที่มีส่วนได้และส่วนเสีย จำนวน 100 ตัวอย่าง ผลการศึกษา พบว่า การเข้าร่วมระบบรับรองระดับประเทศของฟาร์มและโรงเพาะฟัก มาจากการส่งเสริม และประชาสัมพันธ์โดยกรมประมงและความต้องการระบบรับรองจีเอพีจากโรงงานแปรรูป ส่วนการเข้า ร่วมระบบรับรองเอซีซี เกิดจากการตอบสนองต่อความต้องการของลูกค้าต่างประเทศ ส่วนการเข้าร่วม ระบบรับรองอินทรีย์ เกิดจากการเข้าร่วมเป็นโครงการนำร่องสนับสนุนโดยสำนักงานความร่วมมือทาง วิชาการของเยอรมัน เพื่อการเข้าสู่ตลาดกลุ่มเฉพาะและได้รับราคาพิเศษ การเข้าร่วมระบบรับรอง มีผล ต่อการปรับปรุงระบบการจัดการและติดตามตรวจสอบสิ่งแวดล้อม รวมทั้งการปรับปรุงความเป็นอยู่ของ คนงานโดยเฉพาะที่อยู่อาศัยและสาธารณูปโภคอย่างมีนัยสำคัญ แต่การเข้าร่วมระบบรับรองมีค่าใช้จ่าย ในการปรับปรุงฟาร์ม กระบวนการตรวจรับรอง และระบบการติดตามตรวจสอบ อย่างไรก็ตามการผ่าน ระบบรับรองไม่ได้มีผลต่อราคาขายเสมอไป ขึ้นอยู่กับกลไกราคาทางตลาดและสถานการณ์เศรษฐกิจของ

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



โลก แต่ประโยชน์ทางเศรษฐศาสตร์ที่ชัดเจนของระบบรับรอง คือ การสร้างโอกาสทางการตลาด อย่างไร ก็ตามผู้ซื้อมักต้องการระบบรับรองที่พัฒนาในประเทศของตนเองมากกว่า ทำให้ระบบรับรองก้งของ ประเทศไทยไม่ได้รับการยอมรับจากลูกค้าต่างประเทศ ในการปรับปรุงระบบรับรองกุ้ง ควรพัฒนาระบบ รับรองตามแนวทางของเอฟเอโอหรือไอเอสโอ เพราะว่าเป็นมาตรฐานที่ยองรับในระดับสากล ประชาสัมพันธ์และโน้มน้าวลูกค้าต่างประเทศให้เห็นจริงถึงประโยชน์ของระบบรับรองจีเอพี/ซีโอซี พิจารณาค่าใช้จ่ายในการเข้าร่วมระบบรับรองว่าต้องไม่เป็นเหตุให้ต้นทุนการผลิตสูงขึ้นจนไม่สามารถ แข่งขันในตลาดโลกได้ และควรมีการแบ่งปันผลประโยชน์ในการซื้อขายกุ้งที่ผ่านระบบรับรองโดยตลอด ห่วงโซ่ ในระดับนโยบาย ควรพิจารณารวมระบบรับรองจีเอพี/ซีโอซี เข้าด้วยกันตลอดจน รวมหรือแยก ระบบรับรองระดับประเทศและระบบรับรองของต่างประเทศแต่ละระบบให้ชัดเจน เพื่อไม่ให้เกิดความ ้สับสนในผู้ผลิต/บริโภค และสร้างการแข่งขันของระบบรับรองต่างๆ ในการเข้าสู่ตลาดเดียวกัน มีการ ดำเนินการทวนสอบจากผู้ทวนสอบที่ได้รับการรับรองจากหน่วยงานรับรองผู้ทวนสอบ และไม่มี ผลประโยชน์ซ้อนทับ และควรพิจารณาดำเนินการศึกษาเทียบเคียง ระหว่างระบบรับรองของประเทศไทย กับระบบรับรองของประเทศคู่ค้า เพื่อให้เกิดการยอมรับเป็นระบบรับรองเทียบเคียงซึ่งอาจต้อง ดำเนินการผ่านบันทึกข้อตกลงความร่วมมือ ตลอดจนพิจารณาปฏิรูปบทบาทของหน่วยงาน/สถาบันที่ เกี่ยวข้อง เพื่อให้ผลของระบบรับรองนำไปสู่การผลิตกุ้งที่มีจริยธรรม ความรับผิดชอบต่อสิ่งแวดล้อม และสังคม ตลอดจนส่งเสริมระบบรับรองให้เป็นเครื่องมือการตลาดที่นำไปสู่การพัฒนาอย่างยั่งยืน

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ABSTRACT

Project code: RDG5130035

Project title: Effects of certification and labelling requirements from importing countries

on the sustainability of Thai shrimp industry

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Project duration: 18 month

Certification schemes have been introduced to shrimp aquaculture as a communication tool between producers and consumers to stimulate both production and consumption of shrimp product to be more ethical, responsible and sustainable. The certification is continuously growing, while the implications of existing certifications for sustainability are not clearly appreciated. This has led to the evaluation of various certification effects applied in Thailand in terms of environmental, economic and social consequences. The framework of analysis is based on a system analysis approach along with the governance and stakeholder analysis by collecting the data from 100 semi-structured indepth interviews of shrimp stakeholders and 232 closed-end questionnaires of farms and hatcheries. The results showed that the joining Thai GAP ('Good Aquaculture Practice') and Thai COC ('Code of Conduct for Responsible Shrimp Aquaculture') certifications were because of promotional efforts of Department of Fisheries as well as the requirement of GAP certification by local processors. While the primary reason for joining ACC certification was because of requests from overseas buyers. The implementation of organic certification was under the demonstration project supported by GTZ, which was linked to the expectation of farmer for a niche market with a premium price. Joining a certification scheme clearly improved the environmental management and monitoring systems of farms including helped improving the workers' living conditions especially accommodation and facilities. But there was economic implications associated with farm improvement, certification procedure, and monitoring systems, whereas certifications not always had impacts on selling prices that was strongly linked to market demand and the global economic situation. The significant economic benefit of certifications for farms was only marketing opportunities. Buyers usually want the certification that their own country has established. Thus, GAP and COC are not accepted by importing countries. For improvement, FAO Technical Guideline as well as ISO should be followed as they are internationally recognised and accepted. Overseas buyers must be convinced to see the benefits of GAP/COC certification schemes. Joining of certification should not add more burdens to farms and

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the cost of joining certification must not cause higher production costs that cannot be competitive in global markets; benefit gained from selling certified shrimps should be distributed along the supply chain. Area of complementary policy which the Thai government should consider were to consider combining GAP and COC as a single standard as well as to harmonize or to make a clear separation of different standards national, private, and international schemes - to reduce confusions both for producer and buyers, and at the same time competition between two standards for accessing the same markets. Verification should be handled by professional certify body whose qualifications meet the criteria of accreditation body and there must be no conflict of interest. The benchmarking study should be conducted to demonstrate the equivalency of different schemes to be recognised as the benchmarked schemes. In addition, Thailand should consider having Memorandum of Understanding (MOU) with exporting countries to accept the certified products based on the national certification scheme that is proved to be as equivalent as their own scheme. Some institutional reform may be necessary to more clearly separate out different roles within the Thai industry. This is to ensure the implication of certification schemes for more ethical, responsible and sustainable shrimp products.

Keywords: Code of Conduct for Responsible Shrimp Aquaculture (COC), Good Aquaculture Practice (GAP), Shrimp certification, Sustainability, Thai shrimp industry



บทสรุปผู้บริหาร

ระบบรับรองถูกนำมาใช้ในการเพาะเลี้ยงกุ้ง เพื่อเป็นเครื่องมือสื่อสารข้อมูลคุณลักษณะของผลิตภัณฑ์กุ้ง ระหว่างผู้ผลิตและผู้บริโภค ในปัจจุบันมีระบบรับรองมากกว่า 30 ระบบรับรองในระดับโลกที่พัฒนาโดย กลุ่มธุรกิจร้านค้าปลีก สภาอุตสาหกรรม หรือรัฐบาล หลักการและเกณฑ์ข้อกำหนดของระบบรับรอง ต่าง ๆครอบคลุมเรื่องการอนุรักษ์สิ่งแวดล้อม ความรับผิดชอบต่อสังคม คุณภาพและความปลอดภัย อาหาร การตรวจสอบย้อนกลับ และสวัสดิภาพสัตว์ โดยมีความคาดหวังว่าระบบรับรองจะเป็นกลไก กระตุ้นให้เกิดการผลิตและบริโภคอย่างมีจริยธรรม มีความรับผิดชอบต่อสิ่งแวดล้อมและสังคม ตลอดจนส่งเสริมการพัฒนาอย่างยั่งยืน

แนวคิดของระบบรับรองกุ้งเป็นที่ยอมรับเป็นอย่างดีในประเทศไทย มีการพัฒนาและประยุกต์ใช้ระบบ รับรองกุ้งระดับประเทศ 2 ระบบ คือ มาตรฐานฟาร์มเพาะเลี้ยงกุ้ง โค๊ด ออฟ คอนดัค (ซีโอซี) และ มาตรฐานวิธีปฏิบัติที่ดี (จีเอพี) นอกจากนี้ยังมีการประยุกต์ใช้ระบบรับรองกุ้งของต่างประเทศ คือ เอซีซี และมาตรฐานอินทรีย์ โดยเกษตรกรไทย มีการติดตามข้อมูลข่าวสารความเคลื่อนไหวของการพัฒนา ระบบรับรองกุ้งระดับสากล อาทิ เช่น โกบอนล์แก๊ป แนวทางปฏิบัติขององค์การอาหารและการเกษตร แห่งสหประชาชาติ ระบบรับรองขององค์การกองทุนสัตว์ป่าโลกสากล มาตรฐานกุ้งอาเซียน และ มาตรฐานไอ เอส โอ

ระบบรับรองกุ้งมีการพัฒนาอย่างต่อเนื่อง โดยที่ยังไม่ทราบแน่ชัดถึงผลของระบบรับรองที่มีอยู่ต่อการ พัฒนาอย่างยั่งยืน ผู้ที่มีส่วนได้และส่วนเสียของอุตสาหกรรมกุ้งไทยมีความกดดันในการปรับเปลี่ยน ระบบฟาร์มและวิธีปฏิบัติให้สอดคล้องกับความต้องการของระบบรับรอง เพื่อให้สามารถดำเนินธุรกิจ ต่อไปได้และความยั่งยืนของวิถีชีวิต ความต้องการระบบรับรองกุ้งหลากหลายจากผู้ซื้อต่างๆ ทำให้เกิด ความคุกคามต่อเกษตรกรรายย่อยที่มีศักยภาพทางวิชาการและการเงินค่อนข้างจำกัด นอกจากนี้ยังไม่มี หลักฐานที่ชี้ชัดว่าผู้บริโภคตัดสินใจเลือกซื้อโดยใช้ข้อมูลจากระบบรับรอง ในการศึกษานี้ มีวัตถุประสงค์ ในการประเมินผลเชิงสิ่งแวดล้อม สังคม และเศรษฐศาสตร์ ของระบบรับรองกุ้งที่ปฏิบัติในประเทศไทย คือ ซีโอซี จีเอพี เอซีซี และอินทรีย์ ต่อห่วงโซ่อุปทาน เพื่อจำแนกแนวทางการปรับปรุง รวมทั้ง ข้อเสนอแนะเชิงนโยบาย ขอบเขตการศึกษา นับรวมการเปรียบเทียบระบบรับรองกุ้งแบบต่างๆด้วย

กรอบการวิเคราะห์ อาศัยแนวคิดเชิงระบบประกอบกับการวิเคราะห์หลักการบริหารจัดการและวิเคราะห์ ผู้ที่มีส่วนได้ส่วนเสีย เพื่อประเมินความสัมพันธ์ของการผลิต การจัดจำหน่าย และการบริโภคผลิตภัณฑ์ กุ้ง โดยตลอดห่วงโช่ วิธีการรวบรวมข้อมูลในภาคสนาม ทำโดยการสัมภาษณ์เชิงลึกด้วยแบบสัมภาษณ์ แบบกึ่งโครงสร้าง สัมภาษณ์ผู้ที่มีส่วนได้ส่วนเสียโดยตลอดห่วงโช่การผลิต จำนวน 172 ตัวอย่าง จาก

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การสุ่มตัวอย่างแบบเลือก เช่น เจ้าหน้าที่กรมประมง ผู้เชี่ยวชาญ ผู้ตรวจสอบระบบรับรอง โรงงานแปร รูป เป็นต้น และสัมภาษณ์ฟาร์มด้วยแบบสอบถาม จำนวน 232 ตัวอย่าง จากการสุ่มตัวอย่างฟาร์มและ โรงเพาะฟักในประเทศไทย ตามสัดส่วนกำลังการผลิตและขนาดฟาร์มและโรงเพาะฟัก การส่งเสริมและ ประชาสัมพันธ์โดยกรมประมง มีความสำคัญอย่างยิ่งต่อการเข้าร่วมระบบรับรองระดับประเทศของฟาร์ม และโรงเพาะฟัก ความต้องการระบบรับรองจีเอพีจากโรงงานแปรรูป ช่วยสนับสนุนการเข้าร่วมระบบ รับรองอย่างมาก อย่างไรก็ตาม ฟาร์มและโรงเพาะฟักที่เข้าร่วมระบบรับรองจีเอพีในภาพรวม เหตุผลหลักในการเข้าร่วมระบบ รับรองเอชีซี เนื่องมาจากเป็นความต้องการของลูกค้าต่างประเทศที่ร้องขอผ่านโรงงานแปรรูป จึงเกิดการ ร่วมมือกันทางวิชาการและการเงินระหว่างโรงงานแปรรูปและฟาร์มในการเข้าสู่ระบบรับรองด้วยระบบ การทำสัญญาประกัน ส่วนการเข้าร่วมระบบรับรองอินทรีย์ เกิดจากความคาดหวังในการเข้าสู่ตลาดกลุ่ม เฉพาะและได้รับราคาพิเศษ ด้วยการเข้าร่วมเป็นโครงการนำร่องสนับสนุนโดยสำนักงานความร่วมมือทาง วิชาการของเยอรมัน ในการเข้าร่วมระบบรับรองนั้น เกษตรกรทุกคนคาดหวังว่าจะขายกุ้งในราคาที่สูงขึ้ง เพื่อชดเชยกับการลงทุนที่เพิ่มขึ้นในการเข้าสู่ระบบรับรอง

การวิเคราะห์ผลเชิงเศรษฐศาสตร์ บ่งชี้ว่าการเข้าร่วมระบบรับรองมีค่าใช้จ่ายในการปรับปรุงฟาร์ม กระบวนการตรวจรับรอง และระบบการติดตามตรวจสอบ โดยค่าใช้จ่ายในการเข้าร่วมระบบรับรองชีโอชี คิดเป็น 118,000 บาท อันเนื่องมาจากการก่อสร้างอาคารสำนักงาน ห้องเก็บสารเคมี ที่พักคนงาน และ ระบบบันทึกข้อมูล ในขณะที่ค่าใช้จ่ายในการเข้าร่วมระบบรับรองจีเอพีคิดเป็น 80,773 บาท โดยเฉลี่ย อันเนื่องมาจากการก่อสร้างอาคารสำนักงาน ที่พักคนงาน และรั้ว การปรับปรุงจากระบบรับรองจีเอพีเพื่อ เข้าสู่ระบบรับรองชีโอซี มีค่าใช้จ่ายประมาณ 11,8000 บาท อันเนื่องมาจากการพัฒนาระบบบันทึก ข้อมูลและการก่อสร้างห้องเก็บสารเคมี ส่วนกระบวนการตรวจรับรองชีโอซีเพื่อเข้าสู่ระบบรับรองชีโอซี มีค่าใช้จ่ายประมาณ 40,000 ถึง 1,000,000 บาท อย่างไรก็ตามการผ่านระบบรับรองไม่ได้มีผลต่อ ราคาขายเสมอไป แต่ขึ้นอยู่กับกลไกราคาทางตลาดและสถานการณ์เศรษฐกิจของโลก ประโยชน์ทาง เศรษฐศาสตร์ที่ชัดเจนของระบบรับรอง คือ การสร้างโอกาสทางการตลาดมากกว่า

การเข้าร่วมระบบรับรอง มีผลต่อการปรับปรุงระบบการจัดการสิ่งแวดล้อมและการพัฒนาอย่างยั่งยืนด้าน สิ่งแวดล้อมอย่างมีนัยสำคัญ โดยไม่มีฟาร์มใดที่ผ่านระบบรับรองตั้งอยู่ในพื้นที่ป่าชายเลน มีการใช้ลูกกุ้ง จากโรงเพาะฟักที่สามารถแสดงผลการตรวจสอบว่าปลอดเชื้อ มีการเลือกใช้อาหารที่มีคุณภาพและราคา เหมาะสม ตลอดจนจัดเก็บอาหารอย่างเป็นสัดส่วน มีการใช้สารเคมีเฉพาะชนิดที่อนุญาตให้ใช้ในการ เพาะเลี้ยงสัตว์น้ำ โดยฟาร์มที่ผ่านระบบรับรองซีโอซีมักจะมีห้องเก็บสารเคมีและบันทึกข้อมูลการใช้ ฟาร์มที่ผ่านระบบรับรองส่วนใหญ่ มีการตรวจติดตามคุณภาพน้ำในบ่อเลี้ยงอย่างสม่ำเสมอ โดยเฉพาะ

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ฟาร์มที่ผ่านระบบรับรองซีโอซีและเอซีซี มีความรู้เกี่ยวกับมาตรฐานน้ำทิ้งและตรวจวัดคุณภาพน้ำทิ้ง มี การตรวจติดตามการใช้พลังงานและมีแผนการจัดการเพื่อประหยัดพลังงานในบางฟาร์ม การเข้าสู่ระบบ รับรองจีเอพี ทำให้เกิดการปรับปรุงระบบการจัดการด้านสุขอนามัยและการควบคุมความปลอดภัย อาหาร โดยเฉพาะการลดปริมาณการใช้สารเคมี การเข้าสู่ระบบรับรองซีโอซีทำให้เกิดการปรับปรุง แผนผังฟาร์ม รวมทั้งการบำบัดน้ำเสีย ฟาร์มที่เข้าสู่ระบบรับรองเอซีซี พบว่าการปฏิบัติระบบรับรองซีโอ ซี/จีเอพีมาก่อน ช่วยให้ผ่านระบบรับรองเอซีซีได้ง่ายขึ้น อย่างไรก็ตามการเข้าสู่ระบบรับรองเอซีซี นำไปสู่การปรับปรุงระบบเอกสารและการบันทึกข้อมูล ส่วนการเข้าสู่ระบบรับรองอินทรีย์ เป็นผลให้ไม่มี การใช้สารเคมี ใช้อาหารอินทรีย์ และไม่ทิ้งตะกอนเลนนอกฟาร์ม

ส่วนผลกระทบเชิงสังคม พบว่าการเข้าร่วมระบบรับรองทำให้มีการปรับปรุงความเป็นอยู่ของคนงาน โดย เฉพาะที่อยู่อาศัยและสาธารณูปโภค (เช่น น้ำดื่ม ห้องน้ำ และห้องครัว) ฟาร์มที่ผ่านระบบรับรอง โดยเฉพาะระบบรับรองซีโอซีและเอซีซี มีการเข้าร่วมกิจกรรมที่สร้างความสัมพันธ์ที่ดีกับชุมชนเพื่อ แก้ปัญหาการขโมยและการร้องเรียน

สำหรับผู้ชื่อมักต้องการระบบรับรองที่พัฒนาในประเทศของตนเองมากกว่า ทำให้ระบบรับรองกุ้งของ ประเทศไทยไม่ได้รับการยอมรับจากลูกค้าต่างประเทศ ผู้ชื่อ (อะควาสตาร์) ใช้ระบบรับรองกุ้งจีเอพีและ ซีโอซี เป็นดัชนีชี้วัดการควบคุมคุณภาพและในขณะเดียวกันก็พิจารณาระบบรับรองของต่างประเทศหาก ผู้ชื่อต้องการด้วย ในทางตรงกันข้าม ผู้ชื่อ (มาร์คแอนสเปนเซอร์) ไม่ใช้ระบบรับรองใด ๆเลยเพราะคิด ว่าวิธีการจัดซื้อของผู้ชื้อมีความเคร่งครัดมากกว่าเกณฑ์ข้อกำหนดของระบบรับรองที่มีอยู่และสามารถ จัดหากุ้งที่มีคุณภาพสูงกว่าได้ตามต้องการ

ผลการเปรียบเทียบระบบรับรองกุ้งของประเทศไทยกับระบบรับรองของต่างประเทศ พบว่าระบบรับรอง แต่ละระบบให้ความสำคัญกับเกณฑ์ข้อกำหนดในเรื่องการอนุรักษ์สิ่งแวดล้อม ความรับผิดชอบต่อสังคม คุณภาพและความปลอดภัยอาหาร การตรวจสอบย้อนกลับ และสวัสดิภาพสัตว์ ที่ระดับแตกต่างกัน โดย โกบอนล์แก๊ป นับเป็นระบบรับรองที่มีความละเอียดและจำนวนเกณฑ์ข้อกำหนดมากที่สุด นอกจากนี้ พบว่าระบบรับรองโกบอนล์แก๊ปและอินทรีย์ เน้นในเรื่องคุณภาพและความปลอดภัยอาหารและสวัสดิ ภาพสัตว์ มากกว่าระบบรับรองอื่นๆ ส่วนระบบรับรองจีเอพี เน้นเรื่องการตรวจสอบย้อนกลับมากกว่า ระบบรับรองอื่นๆ เช่นเดียวกันกับระบบรับรองโกบอนล์แก๊ป เกณฑ์ข้อกำหนดของระบบรับรองจีเอพี/ชี โอซีสอดคล้องกับระบบรับรองโกบอนล์แก๊ปน้อยกว่าครึ่ง (ประมาณ 25 และ 34 เปอร์เซ็นต์) โดยที่มี ความคล้ายคลึงกันมากที่สุดในหมวดกุ้ง (ประมาณ 40 เปอร์เซ็นต์) ในทางตรงกันข้าม เกณฑ์ข้อกำหนด ของระบบรับรองจีเอพี/ชีโอซีมีความคล้ายคลึงกันกับระบบรับรองเอซีซีสูงมาก (84 และ 90 เปอร์เซ็นต์) จะแตกต่างกันเฉพาะรายละเอียดเกี่ยวกับการตรวจสอบย้อนกลับ ในระหว่างระบบรับรอง

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ต่างประเทศ ได้แก่ ระบบรับรองโกบอนล์แก๊ป เอซีซี และอินทรีย์ พบว่าความคล้ายคลึงกันค่อนข้างน้อย (36 และ 41เปอร์เซ็นต์) แต่ระบบรับรองจีเอพีสอดคล้องกับแนวทางปฏิบัติขององค์การอาหารและ การเกษตรแห่งสหประชาชาติมากกว่าครึ่ง (65 เปอร์เซ็นต์)

จะเห็นได้ว่ามีความท้าทายในการปรับปรุงระบบรับรองกุ้ง ได้แก่ ประการแรก ผู้ซื้อต่างประเทศมี ผลกระทบต่อผู้ที่ส่วนได้และส่วนเสีย แต่ไม่ได้รับการโน้มน้าวให้เห็นจริงถึงประโยชน์ของระบบรับรองจี เอพี/ซีโอซี ประการที่สอง เกษตรกรมีแนวโน้มต่อต้านระบบรับรองเนื่องจากมีค่าใช้จ่ายเพิ่มขึ้นโดยที่ มองเห็นผลกำไรที่ชัดเจน ประการที่สาม โรงงานแปรรูป มีบทบาทสำคัญต่อการสนับสนุนระบบรับรองกุ้ง ผ่านเงื่อนไขการซื้อขายกุ้ง ประการสุดท้าย ธุรกิจร้าค้าปลีกและผู้บริโภค เป็นผู้ที่มีความสำคัญอย่างมาก ในการตอบสนองต่อระบบรับรองกุ้ง

ข้อเสนอแนะเพื่อให้ผลของระบบรับรองนำไปสู่การผลิตกุ้งที่มีจริยธรรม ความรับผิดชอบต่อสิ่งแวดล้อม และสังคม ตลอดจนส่งเสริมการพัฒนาอย่างยั่งยืน คือ ควรมีการสร้างความเข้มแข็งให้กับระบบรับรอง กุ้งระดับประเทศเพื่อการยอมรับในระดับสากล ควรมีการพัฒนาคู่มือผู้ใช้แสดงแนวทางเชิงปฏิบัติในการ เข้าสู่ระบบรับรอง เพื่อให้มีการปฏิบัติในวงกว้างและทำให้กระบวนการตรวจรับรองเป็นไปได้ง่ายขึ้น ควร มีการพิจารณาเชิงเศรษฐศาสตร์ เพื่อไม่ให้เป็นการสร้างภาระให้กับฟาร์ม โดยเฉพาะเกษตรกรรายย่อย ข้อสำคัญ คือ ค่าใช้จ่ายในการเข้าร่วมระบบรับรองต้องไม่เป็นเหตุให้ต้นทุนการผลิตสูงขึ้นจนไม่สามารถ แข่งขันในตลาดโลกได้ และควรมีการแบ่งปันผลประโยชน์ในการชื้อขายกุ้งที่ผ่านระบบรับรองโดยตลอด ห่วงโช่ นอกจากนี้ ควรพิจารณาปฏิรูปบทบาทของหน่วยงาน/สถาบันที่เกี่ยวข้อง การดำเนินการพัฒนา ระบบรับรองและกระบวนการตรวจรับรองโดยกรมประมง ทำให้เกิดความไม่น่าเชื่อถือ จึงควรพิจารณา ให้ภาคเอกชนเข้ามาดำเนินการแทน ประชาชนทั่วไปในชุมชน ควรมีบทบาทในการตรวจติดตามผลของ ระบบรับรองผ่านการลงคะแนนให้กับองค์การบริหารระดับท้องถิ่น

ในระดับนโยบาย ควรพิจารณารวมระบบรับรองจีเอพี/ซีโอซี เข้าด้วยกันตลอดจน รวมหรือแยกระบบ รับรองระดับประเทศและระบบรับรองของต่างประเทศแต่ละระบบให้ชัดเจน เพื่อไม่ให้เกิดความสับสน ในผู้ผลิต/บริโภค และสร้างการแข่งขันของระบบรับรองต่างๆ ในการเข้าสู่ตลาดเดียวกัน มีการ ดำเนินการทวนสอบจากผู้ทวนสอบที่ได้รับการรับรองจากหน่วยงานรับรองผู้ทวนสอบ และไม่มี ผลประโยชน์ซ้อนทับ และควรพิจารณาดำเนินการศึกษาเทียบเคียง ระหว่างระบบรับรองของประเทศไทย กับระบบรับรองของประเทศคู่ค้า เพื่อให้เกิดการยอมรับเป็นระบบรับรองเทียบเคียงซึ่งอาจต้อง ดำเนินการผ่านบันทึกข้อตกลงความร่วมมือ ตลอดจนพิจารณาปฏิรูปบทบาทของหน่วยงาน/สถาบันที่ เกี่ยวข้อง เพื่อให้ผลของระบบรับรองนำไปสู่การผลิตกุ้งที่มีจริยธรรม ความรับผิดชอบต่อสิ่งแวดล้อม และสังคม ตลอดจนส่งเสริมระบบรับรองให้เป็นเครื่องมือการตลาดที่นำไปสู่การพัฒนาอย่างยั่งยืน



EXECUTIVE SUMMARY

Certification schemes have been introduced to shrimp aquaculture as a communication tool between producers and consumers on the features of shrimp products. Up to date, there are more than 30 shrimp certification schemes around the world developed by group of retailers, industry associations, or governments. The principles and criteria of various certification schemes cover at different degrees in the areas of environmental protection, social responsibility, food quality and safety, traceability, and animal welfare. It is expected that certifications will be a mechanism to stimulate both production and consumption of shrimp product to be more ethical, responsible and sustainable.

In Thailand, the concept of shrimp aquaculture certification is well accepted and undertaken by the Department of Fisheries (DoF) via establishing and implementing the COC ('Code of Conduct for Responsible Shrimp Aquaculture') and the GAP ('Good Aquaculture Practices'). Not only the national certification schemes that have been implemented in Thailand, but also some private standards requested specifically from some overseas buyers: which are ACC (Aquaculture Certification Council, Inc.) and Organic (Naturland). Thai farmers and processors are also aware of the movements of shrimp certifications like GLOBALG.A.P., FAO Technical Guideline, WWF certification, ASEAN Shrimp GAP and ISO.

The certification is continuously growing, while the implications of existing certifications for sustainability are not clearly appreciated. Shrimp stakeholders in Thailand are now under pressure to adopt their farming systems and practices to comply with the certification requirements in order to sustain their business and thus their own livelihoods. The emergence of different certification schemes required by different "buyers" has additionally posed a threat especially to small-scale farmers whose technical and financial capacities for application and compliance might be limited. On the consumer side, it is not evident if choices are made according to the information given by certification. In this study, the effects of four main certification schemes applied in Thailand (COC, GAP, ACC and Organic) on shrimp supply chains were analysed in terms of environmental, economic and social consequences to identify the areas for sustainability improvement including policy recommendations. The scope of study also extended to the comparison of four schemes to evaluate the equivalency level.

The framework of analysis is based on a system analysis approach along with the governance and stakeholder analysis to explore how production, distribution and consumption of shrimp products are linked and interact along the whole supply chain. 100 semi-structured in-depth interviews and 232 closed-end questionnaires were conducted to collect the data from various shrimp stakeholders in fields. Farms were randomly sampled throughout the country based on the production proportion and the

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farm's size. Associated stakeholders like hatcheries, processors, DoF officials, local experts and auditor as well as overseas buyers were selected some to gather their opinions.

The promotional efforts of DoF were crucial and identified as the main reason for farms and hatcheries joining GAP and COC certifications. GAP requirements by local processing plants strongly reinforced DoFs campaign. However, COC-certified farms had higher levels of compliance than GAP farms prior to certification in general. The primary reason for joining ACC certification on the other hand was because of requests from overseas buyers who make such a request to local processors; jointed technical and financial efforts between processor and farm through a contract farming system promoted the ACC adoption. The implementation of organic certification is linked to the expectation of farmer on marketing channel to a niche market with premium price, under the demonstration project supported by GTZ. For all certified farms, a premium price was expected to compensate with the required investment and thus higher production cost.

The economic implications of joining a certification were linked to the cost of farm improvement, certification procedure, and monitoring systems. The average expenditure of joining COC was 118,000 baht while that of GAP was 80,733.35 baht. The investment to comply with COC was mainly due to the construction of office, chemical storage room, labour residence and the implementation of data recording systems. The costs associated with GAP certification were mainly linked to the construction of office, labour residence and site entry. To upgrade from GAP to COC, the average expense was 118,000 baht for the data recording systems and chemical-storage room. There was no cost on the certification procedure for GAP and COC as that was subsidized by DoF. In case of upgrading from COC to ACC, the average expense was about 40,000 to 1,000,000 baht. However, certifications had no impacts on selling prices that was strongly linked to market demand and the global economic situation. The significant economic benefit of certifications for farms was only marketing opportunities.

Joining a certification scheme clearly improved the environmental management systems of farms and thus environmental sustainability. All certified farms are not located within mangrove areas. Post-larvae were only sourced from a hatchery that could provide a test report of pathogen free. Feeds were selected based on quality and price, with a storage room. Only chemicals allowed for shrimp farming were used; COC-certified farms had dedicated room for chemical storage and did chemical inventories. Most of the farms monitored the water quality in culturing ponds regularly. ACC- and COC-certified farms were aware of the effluent standards and monitored the effluent quality. Most of the farms monitored the energy use and energy-saving program was taken by some farms. The adoption of GAP significantly improved hygiene management systems and food safety control particularly to the reduction of chemical use. The implementation of COC was strongly linked to the improvement of farm layout including wastewater treatment facilities. The COC/GAP-certified farm found the joining of

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COC/GAO eased the joining of ACC. Documentation systems were the main improvement for farms to comply with ACC. For the organic farm, the significant improvement was related to the non-use of chemical, use of organic feed and no sludge disposal outside the farm.

In terms of social aspects, the joining of certification in general helped improving the workers' living conditions especially accommodation and facilities (i.e. drinking water, toilet, and kitchen). All certified farms esp. COC and ACC engaged in activities with local communities to gain a good relation in order to avoid problems with theft and other complaints.

Buyers usually want the certification that their own country has established. Thus, GAP and COC are not accepted by importing countries whereas private certification schemes (i.e. ACC, GLOBALG.A.P., and Organic) are preferred. An oversea buyer (AquaStar) takes GAP and COC as a general indicator of quality control over commodity chain, but also apply overseas certification schemes with a third-party auditing if clients ask for them. In contrast, M&S does not rely on any certification as they believe that its purchasing policies and procedures are much more stringent than existing certification schemes and secure higher quality shrimp.

The comparison of national (GAP/COC) to international certification schemes (GLOBALG.A.P., ACC, Organic) showed that the focus of different certifications schemes varies with some giving more emphasis to some areas than others. GLOBALG.A.P. is the most comprehensive certification scheme with the highest number of criteria. In all certifications the highest numbers of criteria are on environmental issues. GLOBALG.A.P. and Organic schemes both emphasise on animal health and welfare more than other schemes. Traceability in GLOBALG.A.P. and Thai GAP is given more importance than the others. Compared to GLOBALG.A.P., the GAP and COC criteria are matching less than half in average (25% and 34%) with the highest matching in the shrimp module (approximately 40%). In contrast, COC and GAP are very much in line with ACC (84% and 90%) except that ACC requires more details on traceability systems. Among different international certifications, ACC/Organic and GLOBALG.A.P are matching less than half (36% and 41%). The equivalency level of GAP and FAO Technical Guideline is 65%.

There are challenges to improve certifications. First, overseas buyers are influential stakeholders but they have not yet been clearly convinced of the benefits of GAP/COC certification schemes. Second, farmers are likely to oppose and negotiate because they bear costs without receiving clear benefits, for example, in terms of prices. Third, processors are an important supporter because they have leverage through their purchasing practices. Fourth, consumers are not likely to be as important as they are often portrayed in the success or otherwise of the certification scheme: buyers and the retailers they serve are much more important.

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To ensure the implication of certification schemes for more ethical, responsible and sustainable shrimp products, it was then recommended to strengthen the national schemes for better acceptance from international level. The development of guideline (or user manual) to explain clearly the practical approaches to comply with the required criteria of certification will promote a wider application of certification and facilitate the farm auditing procedure. The economic aspects associated with certification must be taken into account. The joining of certification should not add more burdens to farms especially small-scale farmers. More importantly, the cost of joining certification must not cause higher production costs that cannot be competitive in global markets. Benefit gained from selling certified shrimp should be distributed along the supply chain. Some institutional reform may be necessary to more clearly separate out different roles within the Thai industry. The auditing by DoF who is also the certification developer and promoter leads to the lacking of credibility, and thus private sector should take up this role. The public as residence in host communities directly and through elected local governments should also play an important monitoring role holding authorities and industry more accountable.

Area of complementary policy which the Thai government should consider were to consider combining GAP and COC as a single standard as well as to harmonize or to make a clear separation of different standards — national, private, and international schemes — to reduce confusions both for producer and buyers, and at the same time competition between two standards for accessing the same markets. Verification should be handled by professional certify body whose qualifications meet the criteria of accreditation body and there must be no conflict of interest. The benchmarking study should be conducted to demonstrate the equivalency of different schemes to be recognised as the benchmarked schemes. In addition, Thailand should consider having Memorandum of Understanding (MOU) with exporting countries to accept the certified products based on the national certification scheme that is proved to be as equivalent as their own scheme. Some institutional reform may be necessary to more clearly separate out different roles within the Thai industry. This is to ensure the implication of certification schemes for more ethical, responsible and sustainable shrimp products.



CHAPTER 1 Certification schemes for shrimp aquaculture

1. Overview of shrimp certification schemes

1.1 Development of shrimp certification schemes

The sustainability of the shrimp farming industry has been a subject of controversy and debate at local, national and international levels. Shrimp aquaculture activities have attracted a great deal criticism related to their environmental and social impacts. The most controversial environmental issues are related to the use of natural resources and the deterioration of the ecological life support functions on which our livelihoods depend. Conversion of mangrove areas or rice paddy fields for the development and construction of shrimp ponds are typical examples associated with shrimp farming in the past. The potential environmental impacts and threat to the marine shrimp population and loss of biodiversity through the use of wild-caught broodstock for the larval culture at hatcheries are receiving much attention currently. The use of wild-caught fish processed into fishmeal and fish oil, which are further used for shrimp feed production, has been discussed heatedly. The shifting from black tiger prawn (a local species) to Pacific white shrimp (a non-local species) which has occurred over the past few years has posed a great concern due to its potential impact on biodiversity. There has been a great concern over the higher demand for fishmeal to support the expansion of shrimp aquaculture that might accelerate the rate at which marine fish stocks could become overexploited. The protein input into shrimp ponds in the form of fishmeal is also contentious in terms of the efficiency of resource utilisation. Added to that, the use of various chemicals for water quality control as well as antibiotics for disease treatment has resulted in chemical residues in shrimp products which have alarmed consumers on food safety and quality control issues. As a result, food safety standards have become more stringent and international trade regulations tightened. Product testing at port is more stringent as a consequence.

Shrimp aquaculture production has also attracted attention to social impacts that this might generate. Whilst shrimp farming is desirable to generate income in coastal areas, development of shrimp farming can also lead to negative social consequences especially to local communities that could lead to loss of existing livelihoods and irreversible changes of social structure. Increases in crime rates and road accidents are pointed out as other negative effects in communities following the introduction of shrimp farming. Social conflicts among competing users of natural resources have also been noted. The social problems associated with shrimp farming activities have also been highlighted, especially for small-scale farms which are dominant in Asia including Thailand.

Certification schemes have been introduced to shrimp aquaculture to respond to increasing demands from buyers, retailers and end consumers who seek to assure the

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shrimp aquaculture products in terms of environmental protection, social responsibility, food quality and safety, traceability, and animal welfare. At present, there are more than 10 certification schemes around the world being applied to shrimp aquaculture and each certification scheme seems to have a different focus and does not cover all relevant aspects.

Table 1-1 summarises the shrimp certification schemes around the world in terms of the organisation developing the certification scheme, the year of establishment and the focused areas. In general, various certification schemes can be divided into two main groups: single-aspect certification (i.e. a specific focus area such as Organic or FairTrade); and, multiple-aspect certification (i.e. a combination of environmental, social, food safety and/or traceability such as ACC, COC, GLOBALG.A.P.). The certification schemes are either developed by governmental or non-governmental organisations e. g. groups of retailers or buyers, or industry associations. The certification schemes that were established later seek to cover as many relevant issues as possible, by adding food safety, traceability and animal welfare. Some of them also provide labels (i.e. B2C, Business to Consumer) while some do not (i.e. B2B, Business to Business). Only a few certification schemes are at national level, which are COC (Thailand) and SSoQ (Bangladesh). In some cases, the consumer countries develop certification schemes to be applied to producing countries. It is also the case that some countries develop certification schemes to be applied at regional or international levels.



 Table 1-1
 List of shrimp certification around the world and their focus areas

Certification scheme	Logo/Seal/Label	Implementing country and organisation	Year of establishment	Focused areas
ATJ (Alter-Trade Japan) certification, with "Eco- shrimp" label	ATT from prospits to prospits.	Japan, by consumers' cooperatives and groups for direct trade between producers and consumers	1989	- Environmental protection - Social responsibility
ACC (Aquaculture Certification Council), with "ACC stars" label		USA, by board members of GAA (Global Aquaculture Alliance) and ACC	1999	- Environmental protection - Social responsibility - Food safety
BioGro New Zealand, with "Organic" label		New Zealand, by not-for-profit organic producer and consumer organisation	1983	- Environmental protection
Naturland, with "Organic" label	Northrand contract reports	Naturland, one of the certification bodies for IFOAM organic standards	1982	- Environmental protection
Swiss Import Promotion Programme (SIPPO), with "Organic" label	Sippo S	SIPPO, import promotion and development agency	1999	- Environmental protection
Soil Association, with "Organic" label	STATE OF THE PARTY	UK, by Soil Association	1943	- Environmental protection



Table 1-1 List of shrimp certification around the world and their focus areas (cont)

Certification scheme	Logo/Seal/Label	Implementing country and organisation	Year of establishment	Focused areas
Carrefour, with "Carrefour Quality Line (CQL)" label	บริโภคยร่างนั้นใจ ปลอศกัยกับภาครฐานวงจรคุณภาพการ์ฟูร์	France, by the Carrefour retailer	1998	- Social responsibility - Food safety
GLOBALG.A.P. (The Global Partnership for Good Agricultural Practices, previously known as EurepGAP)	GLOBALG.A.P.	Germany, by the group of EU retailers	2007	- Environmental protection - Social responsibility - Food safety
FairTrade, with "FairTrade" label	FAIRTRADE	Germany, Fairtrade Labelling Organizations (FLO)	1997	- Social responsibility
SSoQ (Shrimp Seal of Quality), with "SSoQ" seal	SSOO O SSOO Married Broad	Bangladesh, Department of Fisheries	2005	- Environmental protection - Social responsibility - Food safety - Traceability
COC (Codes of Conduct for Responsible Shrimp Aquaculture), with the "Thai Quality Shrimp" label	THE STATE OF THE S	Thailand, Department of Fisheries	1998	- Environmental protection - Social responsibility - Food safety - Traceability
EJF (Environmental Justice Foundation), the consumer guide	ENVIRONMENTAL JUSTICE FOLKIDATION	UK, EJF	2000	- Environmental protection - Social responsibility



 Table 1-1
 List of shrimp certification around the world and their focus areas (cont)

Certification scheme	Logo/Seal/Label	Implementing country and organisation	Year of establishment	Focused areas
International Principles for Responsible Shrimp Farming	Francisco September 1990	FAO, WWF and NACA	2006	Environmental protectionSocial responsibilityFood safetyTraceability
Krav	THE CONTRIBUTE THE PARTY OF THE	Sweden	1985	- Environmental protection - Animal welfare
NASAA	NASAA CERTIFIED ORGANIC	Australia	1986	- Environmental protection
Debio	ASTROTOHO NATIONAL PROPERTY NA	Germany	1967	- Environmental protection
Bio Suisse	B I O	Switzerland	1981	- Environmental protection





Table 1-1 List of shrimp certification around the world and their focus areas (cont)

Certification scheme	Seal/Label	Implementing country and organisation	Year of establishment	Focused areas
ABCC	OO BRY	Brazil	Information are not available in English	- Environmental protection - Social responsibility - Food safety - Traceability
Bio Austria	Bio	Austria	Information are not available in English	- Environmental protection
AB Bio	AGRICULTURE	France	Information are not available in English	- Environmental protection
Shrimp Aquaculture Dialogue		WWF	Ongoing, supposed to be launched in 2010	Environmental protectionSocial responsibilityFood safetyTraceabilityAnimal welfare
ASEAN Shrimp GAP		ASEAN countries	Ongoing, supposed to be launched in 2010	Environmental protectionSocial responsibilityFood safetyTraceability
ISO/TC 234 Fisheries and Aquaculture	International Organization for Standardization	ISO	Ongoing, supposed to be launched in 2010	



2. Introduction of shrimp certification schemes

In this study, the main focus will be given to the overseas certification schemes being applied in Thailand, namely: ACC (US), Wegman (US), GLOBALG.A.P. (EU), Organic (Naturland), and national certification schemes which are Thai COC and Thai GAP (Thailand) including the self-declaration certification schemes like Siam Bio Shrimp and Surat Shrimp Programme. In addition, the regional and international shrimp certification schemes are also within the scope of interest: FAO Technical Guideline on Aquaculture Certification, WWF, and ASEAN Shrimp GAP. A brief introduction of each certification scheme is as follows.

2.1 ACC

Development of certification

The ACC (Aquaculture Certification Council, Inc.) certification scheme was developed by using the Global Aquaculture Alliance (GAA)'s Best Aquaculture Practices (known as "BAP" standard), which covers social, environmental and food safety aspects at farm, hatcheries and processing plants. GAA, an international, non-profit trade association dedicated to advancing environmentally and socially responsible aquaculture, has developed BAP to provide certified products to those who want assurance that it is environmentally responsible to buy farm-raised seafood.

Theme and focus

ACC certification is mainly focused on environmental impacts, social responsibility, food safety and traceability

Scope of certification criteria

BAP standards are broadly divided into community, environment, food safety and traceability aspects. The community aspects include compliance with national laws and regulations regarding legal rights for land use, water use construction and operation, and access to mangrove areas. Compliance with local and national labour laws to ensure adequate worker safety, compensation and living conditions are also included in this aspect. Environmental aspects include protection of mangrove areas and surrounding ecosystem (biodiversity protection), adequate effluent (water, sediment and waste) management to protect against adverse impacts on the local ecosystem as well as proper storage and disposal of supplies. Food safety aspects in ACC deal with the controlled use of drugs and chemicals as well as microbial sanitation. Food safety also includes proper harvest and transport of shrimp while maintaining temperature control and minimizing physical damage and contamination. For the food processing stage, there is requirement for an HACCP plan and process control program to control food hazards and ensure product safety. Product traceability is a crucial component of the ACC. It interconnects links in the seafood production chain and allows each processed lot to be traced back to the culture system and inputs of origin.



2.2 Wegman

Development of certification

Wegman Food Market Inc. has launched a purchasing policy for environmentally-preferable farmed Shrimp products. This policy intends to build upon and promote the International Principles for Responsible Shrimp Farming.

Theme and focus

The standard is focused on the key environmental issues, but not covering labour and social justice issues.

Scope of certification criteria

Apart from environmental issues considered, Wegman also requires that suppliers must comply with all applicable laws, including labour laws. An annual report demonstrating the compliance with at least 9 out of 12 criteria is essential for this standard.

2.3 GLOBALG.A.P.

Development of certification

GLOBALG.A.P. (The Global Partnership for Good Agriculture Practices, previously known as EUREPGAP) certification scheme was initiated by retailers belonging to the Euroretailer Produce Working Group (EUREPGAP). It is based on the integrated farm assurance system aiming to minimise adverse environmental impacts of farming operations, reducing the use of chemical inputs, ensuring food safety issues and animal welfare. The standard also includes issues associated with workers' welfare.

Theme and focus

GLOBALG.A.P.'s criteria include environmental impact, social welfare and responsibility, food safety and traceability

Scope of certification criteria

GLOBALG.A.P. is a business-to-business tool between producers and retailers. The certification scheme was firstly introduced for crops and livestock. Later on, the scope was extended to cover aquaculture products including shrimp. The criteria of GLOBALG.A.P. are divided into four modules: all farm base, aquaculture base, shrimp, and social criteria for shrimp farming. Environmental aspects, worker health and welfare, and traceability are the criteria specified in the all farm base while aquaculture base mainly covers shrimp farming management in terms of environment management, waste management, and animal welfare. The criteria of shrimp module are associated with good management practices for shrimp farming activities starting from post-larvae production at hatchery to culturing and harvesting at farm, as also feed aspects associated with the feed production at feed mill. Social practices such as workers' rights, child labour and social environment are the social criteria for shrimp farming.



2.4 Organic (Naturland)

Development of certification

Naturland association is an internationally operating certifier for Organic agriculture. Naturland's organic aquaculture certification scheme is the pioneer organic shrimp certification scheme, based on two underlying principles. One is, as the term "organic" suggests, the minimal use of chemicals. The other is to grow the animals in conditions as close as possible to their natural state.

Theme and focus

Organic standard focuses on environmental and social responsibilities.

Scope of certification criteria

The first principle results in the use of conventional medicines, routine and prophylactic treatment with chemo-synthetic drugs as well as hormones being not permitted. Fertilisation must also be done using organic fertilisers preferably from certified organic farming systems. The application of the second principle starts right from the breeding stage where reproduction must take place in a natural way. Species occurring naturally in the region are preferred as stock. Artificial lighting and heating should be reduced as much as possible. During the culture stage, the pond system is to be designed as far as possible to support the natural foraging behaviour of shrimp which are typically feeders of benthic micro-organisms and detritus. Aeration or oxygenation is not permitted continuously and low water exchange is recommended. A limit has been placed on the stocking density as well as the amount of shrimp biomass in the ponds over the entire production cycle. Feed conversion ratio serves as an additional indicator for maintaining a permissible stocking density. Apart from these, the certification also covers the important issue of site location specifying that mangrove areas have to be protected. In case a farm is located on a former mangrove area, reforestation is required. Also, recommendations are made on the protection of ecosystems in the farm and surrounding areas including regular monitoring of effluent water quality, minimising outflow of nutrients and preventative measures against salinisation. Social standards regarding housing and living conditions of workers are covered as well as free access of the local community to the open waters adjoining the farm area.

2.5 Thai COC and GAP

Development of certifications

Following the FAO's Code of Conduct for Responsible Fisheries and international standard of CODEX and health and safety standard of importing countries, Code of Conduct for Responsible Shrimp Farming (know as "COC") and Good Aquaculture Practice (known as 'GAP') have been developed as the national shrimp certification schemes by the Department of Fisheries (DoF).



Theme and focus

COC standard covers the environmental impact, social responsibility, food safety and quality, animal health and welfare and traceability

Scope of certification criteria

The principal elements of COC are related to environmental management program of shrimp farming production activities in accordance with to ISO 14001 Environmental Management System. COC highlights the environmental issues associated with farm location and pond management as well as social responsibility in terms of relationships with community and membership of association.

2.6 Thai GAP

Development of certifications

Following the FAO's Code of Conduct for Responsible Fisheries and international standard of CODEX and health and safety standard of importing countries, Good Aquaculture Practice (known as 'GAP') have been developed as the national shrimp certification schemes by DoF.

Theme and focus

COC standard covers food safety and quality, environmental impact, social responsibility and traceability

Scope of certification criteria

While COC focuses on environmental and social responsibility, Good Aquaculture Practice (known as 'GAP') pays particular attention to the sanitary management practices to maintain hygienic conditions in production areas and facilities to produce good quality and safe shrimp products. A clean water supply source and good sanitary management farm facilities especially the sewage and wastewater systems exemplify the management practices required by GAP. Both schemes are implemented in hatchery, farm and harvester.

2.7 Siam "Bio Shrimp"

Development of certification

The Federation of Shrimp Farmer Cooperatives of Thailand (FOSCOT) has initiated and developed the Siam "Bio Shrimp" certification scheme based on GAP.

Theme and focus

Siam Bio Shrimp is mainly focused on food safety, environmental and social responsibilities.



Scope of certification criteria

Four key areas are emphasised in this schemes are: stocking density not more than 50,000 post-larvae/rai, no antibiotic residues, using microorganisms for disease control, and growing seaweed as provide habitats for shrimp as well as to improve biodiversity.

2.7 Surat Shrimp Programme (SSP)

Development of certification

The Surat Thani Shrimp Club has developed the Surat Shrimp Programme (SSP) based on GAP, to prepare themselves on barriers to trade from ACC and GOLBALG.A.P. (Prachchadturakit, 2009).

Theme and focus

The purpose of SSP is to produce a high-quality, safe for consumers, friendly to environment, responsible for society, and traceable shrimp products.

Scope of certification criteria

SSP is only applied in the farms who are belong to the Surat Thani Shrimp Club and the Thai Shrimp Farmers Association. To control the performance of SSP farms, all farms must attend the meetings at least 10 times/year (meetings are organized twice a month). At present, there are 37 farm members that can produce about 10,000 tons/year under the condition that 30% of harvest shrimp production must be sold through a contract farming system with a specific processing plant and the remaining can be sold elsewhere.

2.8 FAO Technical Guideline on Aquaculture Certification

Development of certification

FAO recognises a wide range of political, social, economic and environmental conditions of producing countries at global level and certification schemes should not create obstacles to trade or exclude small-scale farmer from market chains. As a result, FAO has therefore developed technical guidelines on aquaculture certification to provide guidance for the development, organization and implementation of credible aquaculture certification schemes. The minimum requirements are defined according to national laws and regulations as well as international agreement, through 6 stakeholder consultation meetings.

Theme and focus

Areas of criteria should cover: animal health and welfare, food safety, environmental integrity, and social-economic aspects.



Table 1-2 Principles of aquaculture certification schemes (FAO, 2010)

Principle	Contents
1	Aquaculture certification schemes should be based on international standards or guidelines,
	where applicable, and must recognise the sovereign rights of States and comply with
	relevant local, national and international laws and regulations. They must be consistent with
	relevant international agreements, conventions, standards, codes of practice and guidelines.
2	Aquaculture certification schemes should recognise that any person or entity undertaking
	aquaculture activities is obliged to comply with all national laws and regulations.
3	Aquaculture certification schemes should be developed based on the best scientific
	evidence available, also taking into account traditional knowledge, provided that its validity
	can be objectively verified.
4	Aquaculture certification schemes should be developed and implemented in a transparent
	manner and should ensure that there is no conflict of interest among the entities that are
	responsible for standard setting, accreditation, and certification. These entities should
	facilitate mutual recognition, strive to achieve harmonization and recognise equivalence,
	based on the requirements and criteria outlined in these guidelines.
5	Aquaculture certification schemes should be open to scrutiny by consumers, civil society,
	and their respective organisations and other interested parties, while respecting legitimate
	concerns to preserve confidentiality.
6	Aquaculture certification schemes should be credible and robust, be fully effective in
	achieving their designated objectives.
7	Aquaculture certification schemes should promote responsible aquaculture during
	production as outlined in the FAO Code of Conduct for Responsible Fisheries, in particular
_	the Article 9, Aquaculture Development.
8	Aquaculture certification schemes should include adequate procedures for maintaining
	chain of custody and traceability of certified aquaculture products and processes.
9	Aquaculture certification schemes should establish clear accountability for all involved
	parties, including the owners of certification schemes, accreditation bodies and the
4.0	certification bodies, in conformity with international requirements, as necessary.
10	Aquaculture certification schemes should not discriminate against any group of farmers
	practising responsible aquaculture based on scale, intensity of production, or technology;
	promote cooperation among certification bodies, farmers and traders; incorporate reliable,
	independent auditing and verification procedures; and should be cost-effective to ensure
11	inclusive participation of responsible farmers.
11	Aquaculture certification schemes should strive to encourage responsible trade, consistent
	with the FAO Technical Guidelines on Responsible Fish Trade, and should provide the
	opportunity for aquaculture products to enter international markets without obstacles to
12	trade.
12	Aquaculture certification schemes should ensure special considerations are provided to
	address the interests of resource- poor small-scale farmers, especially the financial costs and
12	benefits of participation, without compromising food safety.
13	Aquaculture certification schemes should recognize the special needs for developing
	countries. However small-scale farmers in some developing countries are in need of capacity
	building and may be unable to meet the requirements of aquaculture certification schemes
	immediately.



Scope of certification criteria

The minimum substantive criteria related to animal health and welfare, food safety, environmental integrity, and social-economic aspects that should be addressed in aquaculture certification are given in the FAO technical guidelines.

2.9 International standards for responsible shrimp aquaculture (WWF)

Development of certification

WWF has been active partner in the Shrimp Aquaculture and the Environment Consortium (which also includes the World Bank, NACA and FAO) since 1999. After more than 140 meetings the consortium published a set of international principles on responsible aquaculture (FAO et al. 2006).. As follow-up WWF has run 8 roundtables to create standards for various aquaculture species including shrimp (WWF 2010) called "Draft Proposed Standard for responsible Shrimp Aquaculture" which is a part of the Shrimp Aquaculture Dialogue initiative convened by the World Wildlife Fund (WWF). A series of dialogue events on shrimp were held in 2008 and 2009. The next meeting of the Shrimp Aquaculture Dialogue will be held in March 2010 in Indonesia and will discuss draft standards for responsible shrimp farming. The plan is to hand-over the completed standards to a new third-party certification organization which WWF will cofound (WWF 2010).

Theme and focus

The scope of interest is related to social and environmental responsibilities based on the principles defined in the international principles on responsible aquaculture.

Table 1-3 Principle of International standards for responsible shrimp aquaculture (WWF)

Principle	Criteria	Indicator
1	1.1	1.1.1 Documents proving compliance with local and national authorities are available (e.g., permits, evidence of lease, concessions and rights to land and/or water use) 1.1.2 Documents proving compliance with all tax requirements 1.1.3 Documents proving compliance with all labor laws and regulations 1.1.4 Documents proving compliance with discharge regulations or permits 1.1.5 Only theraputants and chemical (e.g. chemicals, drugs, pesticides and probiotics etc.) authorized by national authorities and used in accordance to this standard are used
2	2.1	2.1.1 Allowance for siting in National Protected Areas (PAs) 2.1.2 Allowance for siting in mangrove ecosystems



		2.1.3 Allowance for siting in natural wetlands.
		2.1.4 Allowance for siting in habitats of species listed by the IUCN Red List.
		2.1.5 Allowance for siting in critical habitats of species at risk9 as defined by national listing processes.10
		2.1.6 Minimum width and density of buffer zone between farm boundary and closest (exposed coast) maximum high tide line
		2.1.7 Minimum width and characteristics of riparian buffers between farms and natural waterways
		2.1.8 Size of corridors on farms
		2.1.9 Presence and content of a BEIA statement.
		2.1.10 Accreditation of the BEIA assessment team
		2.1.11 Public availability and transparency of BEIA.
		2.1.12 Allowance for siting in High Conservation Value Areas (HCVA)
		2.1.13 Scientific conservation planning
	2.2	2.2.1 Soil texture required for ponds and canals not covered with a plastic liner or other waterproof material
		2.2.2 Allowable water loss29 in ponds
		2.2.3 Allowance for the use of fresh groundwater for diluting salinity in pond
		2.2.4 Water-specific conductance or chloride concentration in adjacent freshwater wells30 and surface freshwater bodies
		2.2.5 Soil-specific conductance or chloride concentration in adjacent land ecosystems and agricultural fields
		2.2.6 Dimensions of sediment containment area
		2.2.7 Specific conductance or chloride concentration of sediment used as fertilizer
	2.3	2.3.1 Side slope33 of open canals
		2.3.2 Bottom slope, total depth, width at the bottom, width of the
		water surface and top width of open canals 2.3.3 Presence of a freeboard34 on open canals
		*
		2.3.4 Presence of lining in vulnerable reaches, such as bends, steep slopes, changes in width, reaches with unstable soil, and junctions to
		control erosion and scouring in open canals
		2.3.5 Side slope of pond banks
		2.3.6 Freeboard of pond banks after settlement
		2.3.7 Top width of pond banks
		2.3.8 Siting of farms in relation to natural waterways in the
	<u> </u>	immediate farm area.



	1	
3	3.1	3.1.1 Farm owners shall commission or undertake a participatory Social Impact Assessment (p-SIA)37 and disseminate results and outcome openly in locally appropriate language. Local government and at least one civil society organization chosen by community shall have a copy of this document.
	3.2	3.2.1 Farm owners shall draft and apply a verifiable conflict resolution policy for local communities. The policy shall state how conflicts and complaints will be tracked transparently and explain how to respond to all received complaints. Complaint boxes, complaint registers, and complaint acknowledgement receipts (in local language(s)) are used.
	3.3	3.3.1 Farms shall purposely seek to employ people from surrounding villages before turning to migrant and/or distant workers
	3.4	3.4.1 The contracts are on paper in appropriate language and cosigned copies are in the hands of both parties
		3.4.2 The contracts include basic provisions (see guidance section for information about basic provisions) that ensure the full implication of the agreement is mutually understood
		3.4.3 There are recorded meetings between the purchaser and the contract farmers to discuss and/or negotiate in open and transparent fashion
4	4.1	4.1.1 Number of incidences of child labor in violation of ILO Convention 138 and/or ILO Convention 182, with the additional exception that any child working on the farm must be 15 years of age or older
	4.2	4.2.1 Number of incidences of forced, bonded or compulsory labor
	4.3	4.3.1 Evidence of proactive anti-discrimination policy
		4.3.2 Number of incidences of discrimination
		4.3.3 Women and men receive equal pay for equal work. Different ethnic groups receive equal pay for equal work
	4.4	4.4.1 Percentage of workers trained in health and safety practices, procedures and policies. Safety equipment provided and in use. Evidence that all farm employees have been trained and fully understand the training.
		4.4.2 Occurrences of health- and safety- related accidents and violations recorded and corrective actions taken. No persons under 18 involved in accidents.
		4.4.3 Employer responsibility and proof of insurance (accident/injury) for employee costs in a job-related accident or injury when not covered under national law
	4.5	4.5.1 The percentage of employees who are paid basic needs / living wages or legal minimum wage (whichever is highest)
	4.6	4.6.1 The percentage of employees with access to trade unions, self- organization, and ability to bargain collectively or worker access to representative(s) chosen by



		workers without management interference.
	4.7	4.7.1 Incidences of physically or mentally abusive55 disciplinary
	'''	actions
		4.7.2 Evidence of abusive disciplinary policies and procedures
	4.8	4.8.1 Incidences, violations, abuse of working hours, and overtime laws/ expectations
	4.9	4.9.1 Paper contracts: A complete set of contracts is filed in office, mutually signed, and copies are available with employee.
		Verbal contracts: Employer and employee cite consistent contract conditions in independent interviews.
	4.10	4.10.1 Management and the full workforce meet at least twice per year on the basis of written agendas and written minutes of the meetings
5	5.1	5.1.1 Demonstration of functional and documented preventive tools to prevent:
		1) Diseases from the surrounding environment entering the farm (predator and vector control),
		2) Diseases from the farm spreading to the surrounding environment (water filtration/sterilization),
		3) the spreading of disease within the farm [avoid cross
		contamination, detect and prevent emerging pathogen(s), and
		monitor external signs of pathologies and moribund animal] 5.1.2 Presence of net mesh, grills, screens, or barriers on inlets of farm that are appropriately sized to minimize entry of disease vector Or Mesh size for mechanical filtration of supply water
		5.1.3 Three-day average minimum daily dissolved oxygen concentration in pond bottom with measurement recorded one hour before sunrise
		5.1.4 Daily minimum pond water pH
		5.1.5 Annual average farm survival rate (SR) and relative standard deviation (RSD) in :
		1) Unfed and non-aerated ponds
		2) Fed but non-aerated ponds 3) Fed and permanently aerated64 ponds
		5.1.6 % of stocked post larvae (PL) that are SPF or SPR
	5.2	5.2.1 Allowance for intentional lethal predator control of any protected, threatened or endangered species as defined by the International Union for Conservation of Nature (IUCN) Red List,or state, local or national governments
		5.2.2 Allowance for use of lead shot for predator control of non- protected, threatened or endangered species
		5.2.3 Establishment of a scientifically substantiated predator monitoring program that documents the frequency of visits, species, and number of animals interacting with the farm



	1.5.2	
	5.3	5.3.1 Allowance for use of antibiotic and medicated feed on labeled
		products
		5.3.2 Presence of records listing all product stocked and used on the
		farm
		5.3.3 Evidence proving all chemical product instructions are on the
		farm and are available to farm workers
		5.3.4 Allowance for treating water with pesticides,72 with the
		exception of Tea-seed-cake and Rotenone in the absence of shrimp
		Or
		Allowance for the use and storage on site of pesticides that are
		banned, restricted or identified as extremely to moderately
		hazardous by the Rotterdam Convention on Prior Informed Consent
		(PIC), the Stockholm Convention on Persistent Organic Pollutants
		(POPs), the World Health Organization (WHO) or the European
		Commission.
		5.3.5 Allowance for discharge of all chemicals without previous
		neutralization
		5.3.6 Pesticide and chlorine residues in pond water when shrimp are
		present
		5.3.7 Allowance of probiotic bacterial strains deemed not harmful by
		the appropriate competent authorities
6	6.1	6.1.1 Allowance for non-indigenous shrimp species unless those
		species are already widely used in commercial production locally by
		the date of the publication of the ShAD standards; there is no
		evidence of establishment or impact on adjacent ecosystems; and
		the species have been approved for aquaculture use by a process
		based on ICES code of practice on the introductions and transfers of
		marine organisms or comparable protocol.
		6.1.2 For native species, post-larvae must be sourced in order to
		prevent genetic contamination of their population
	6.2	6.2.1 Documentation provided demonstrating compliance with
	0.2	regional, national and international importation guidelines (e.g. OIE
		and ICES) for the prevention of disease introduction and the
		introduction of invasive species
		6.2.2 Shrimp PL certified SPF against OIE disease official list and
		country specific disease not specifically listed under OIE
		6.2.3 % of total post-larvae from closed loop hatchery (i.e. farm-
		raised broodstock)
		6.2.4 Wild-caught broodstock must be sourced from fisheries with an
		established fishery management plan or certified fisheries
		6.2.5 Allowance for wild-caught PL
	1	



	6.3	6.3.1 Evidence of a well-designed and well-maintained culture
	0.5	system to prevent escapes at harvest and during grow-out
		demonstrated through the following requirements:
		A. Presence of effective screens or barriers of appropriate mesh size
		for the smallest animals present
		B. Evidence that pond banks or dykes are of adequate height and
		construction to prevent breaching in exceptional flood events
		C. Regular, timely inspections are performed, and recorded in a permanent register
		D. Evidence of timely repairs to the system are recorded
		E. Installation and management of trapping devices to sample for the
		existence of escapes; data is recorded.
		F. Traps on water outlets to catch/kill escapes
		G. Evidence of escape recovery protocols
		H. Harvested shrimp shall be killed or slaughtered on site
		6.3.2 Evidence of records on escapes and actions taken to prevent
		reoccurrence
	6.4	6.4.1 Allowance for the culture of transgenic shrimp (including the
		offspring of genetically engineered shrimp)
7	7.1	7.1.1 Timeframe for producers to source feed containing fishmeal or
		fish oil originating from fisheries certified by an ISEAL member's
		certification scheme that addresses environmental and social
		sustainability
		7.1.1a Allowance for fisheries that are classified as depleted or
		overfished by regional, national or local fisheries management
		authorities
		7.1.1b Allowance for the use of fishmeal and fish oil in shrimp feed
		(including those made from fisheries by-products) containing
		products from fisheries that are listed on CITES Appendix I, on the
		IUCN's Red List (in categories: Near Threatened, Vulnerable,
		Endangered, and Critically Endangered)
		7.1.1c Stock status or assessment of fisheries used for feed sourcing
		must have been assessed within three (exact number of years to be
		determined) years and must be peer reviewed by individuals outside
		the organization that created the assessment
		7.1.1d Demonstrate consideration for species interaction issues
		7.1.2 By-product feed ingredients used are unsuitable for human
		consumption, not from <i>Penaeid</i> shrimp, and acquired from a
		sustainable source
		7.1.3 The certified farm, via its feed supplier, must provide a feed
		formulation showing all major (> 5%) marine ingredients
	7.2	7.2.1 Timeframe for producers to source non-marine ingredients
		from sources certified by an ISEAL member's certification scheme
		that addresses environmental and social sustainability
	+	7.2.1a Presence and evidence of a responsible sourcing policy from
		the feed manufacturer for feed ingredients which comply with
		the reed manufacturer for reed ingredients which comply with



<u> </u>	
	internationally recognized moratoriums and local laws, including
	vegetable ingredients or products derived from vegetable
	ingredients. The ingredients must not come from the Amazon Biome,
	as geographically defined by the Brazilian Soya Moratorium.
	7.2.1b Chemical and Pesticide Use in agriculture
	7.2.2 The certified farm, via its feed supplier, must provide a feed
	formulation showing all major (> 5%) non-marine ingredients
7.3	7.3.1 % feed that is of GMO origin
7.4	7.4.1 Land Animal Byproducts
7.5	7.5.1 Feed Fish Equivalence Ratio (FFER)
	7.5.2 Economic Feed Conversation Ratio (eFCR)
7.6	7.6.1 Amount of nitrogen released from the culture system per ton of shrimp produced: see formula below
	7.6.2 Amount of phosphorus released from the culture system per
	ton of shrimp produced: see formula below
	7.6.3 Concentration of settleable solids in effluent water from
	aerated ponds
	7.6.4 Average, daily, minimum dissolved oxygen concentration in
	receiving water body
7.7	7.7.1 Presence of records summarizing the facilities' energy consumption by sources97
	7.7.2 Presence of records verifying the Annual Cumulative Energy
	Demand (MJ or kWh/ tonne of shrimp)
7.8	7.8.1 Percentage of combustibles contained in bunds
	7.8.2 Percentage of chemicals stored in impermeable containers or buildings
	7.8.3 Percentage of used lubricants recycled or turned over to an
	accredited waste management company
	7.8.4 Percentage of chemical containers reused or turned over to an
	accredited waste management company
	7.8.5 Percentage of non-hazardous, non-recyclable wastes turned
	over to an accredited waste management company or landfilled
	7.8.6 Percentage of non-hazardous recyclable wastes reused or
	turned over to a recycling company
	· · · · · · · · · · · · · · · · · · ·



Scope of certification criteria

The Global Steering Committee was formed in Feb 2009 to guide the development of standard. The GSC is a voluntary group composed of members from shrimp aquaculture industry from social and environmental non-governmental organization, academia, and certifiers who represents the major shrimp producing regions of the world. The ongoing process is public consultation, and it is expected that the standard will be finalised in 2010.

2.10 ASEAN Shrimp GAP

Development of certification

The ASEAN Shrimp Alliance endorsed in November 2007 fosters cooperation between government and private sector in the ASEAN region. Meetings of the Alliance held in Bangkok in mid 2009 discussed harmonization of shrimp aquaculture standards and possible cooperation on establishing an ASEAN Aquaculture Standard, a certification body, website and joint position on shrimp trade (SEAFDEC 2009)... Agreement was also reached to establish a regional expert group to develop the ASEAN Shrimp GAP and implementation strategy. This group met in late September 2009 to discuss draft that had been based on FAO technical guideline and agreed on key minimum criteria (ASA 2009). The process is expected to be finalized at next meeting of Alliance in March 2010 and submitted to FAO sub-committee on Aquaculture in June.

Theme and focus

ASEAN Shrimp GAP is focused 5 main areas: food safety and quality, environmental integrity, social responsibility, animal health and welfare, and traceability

Scope of certification criteria

The draft of ASEAN Shrimp GAP is based on the reviewing of existing national shrimp certification scheme in ASEAN countries. The criteria considered are also based on the minimum substantive criteria of FAO technical guideline with consensus from all ASEN countries.

2.10 ISO/TC 234 Fisheries and Aquaculture

Development of ISO standard

The development of various shrimp certification schemes at both national and international level has led to the development of ISO/TC 234 Fisheries and Aquaculture (Table 1-3) which is now ongoing.



Table 1-4 Development of ISO/TC 234 Fisheries and Aquaculture

TC	Contents
TC 234/AHG 1	Cage technology
TC 234/AG 1	Aquaculture environmental management
TC 234/AG 2	Aquaculture technology
TC 234/AHG 2	Food safety for aquaculture farms
TC 234/WG 1	Traceability of fish products
TC 234/WG 2	Environmental monitoring of the seabed impacts from marine finfish farms

4. Status of certified shrimp farms in Thailand

At present, the number of ACC-, Organic-, COC- and GAP-certified hatcheries, farms and processors (Table 1-5) are: 2 ACC-certified hatcheries, 12 farms, and 26 processors; 1 Organic-certified farm; 48 COC-certified hatcheries and 40 farms; 696 GAP-certified hatcheries, and 14,552 farms. The GAP-certified farms are mainly in the Central region. ACC-certified farms are mostly in the South while the only Organic-certified is in the East (Chanthaburi).



<u>Table 1-5</u> Current number of certified hatcheries, farms and processing plants

Region	ACC		Organic (Naturland)		сос		GAP					
	Н	F	Р	Н	F	Р	Н	F	Р	Н	F	Р
Central												
Chachengsao	0	0	1	0	0	0	0	0	0	103	4,134	3
Prachuabkirikhan	0	0	0	0	0	0	0	0	0	13	731	0
Samut Sakorn	0	0	14	0	0	0	0	0	0	0	1,508	142
Petchaburi	0	0	1	0	0	0	0	3	0	2	221	3
Ratchaburi	0	1	0	0	0	0	0	0	0	0	0	0
Samutsongkram	0	0	0	0	0	0	1	1	0	3	75	25
Samutprakan	0	0	2	0	0	0	0	0	0	0	0	34
East												
Chanthaburi	2	0	2	0	1	0	1	6	0	194	1,198	4
Trad	0	0	0	0	0	0	0	0	0	3	806	2
Rayong	0	0	0	0	0	0	1	7	0	9	387	27
Chonburi	0	0	0	0	0	0	6	0	0	99	344	17
South												
Songkla	0	2	0	0	0	0	7	4	0	63	805	44
Nakorn Sri	0	0	0	0	0	0	12	4	0	78	1,448	1
Thammarat												
Surat Thani	0	1	0	0	0	0	0	1	0	67	643	10
Krabi	0	1	0	0	0	0	3	0	0	6	409	1
Phang Nga	0	2	0	0	0	0	6	3	0	31	344	2
Satun	0	1	0	0	0	0	5	0	0	22	362	2
Chumporn	0	3	1	0	0	0	0	3	0	2	375	5
Trung	0	1	0	0	0	0	1	0	0	16	426	6
Ranong	0	1	0	0	0	0	0	6	0	0	106	0
Narativas	0	0	0	0	0	0	0	0	0	0	7	1
Pattani	0	0	0	0	0	0	2	2	0	0	127	12
Pattalung	0	0	0	0	0	0	0	0	0	0	78	0
Phuket	0	0	0	0	0	0	3	0	0	45	18	5

Note: H = Hatcheries; F = Farms; P = Processing plants



CHAPTER 2 Overview of the research project

1. Rationale

The demand for shrimp products and the intensive production of farmed shrimps are constantly increasing whilst the meaning of sustainability of shrimp production and consumption is not clearly understood yet. Developing countries have benefited from the foreign revenues earned from the export of farmed shrimp products. These benefits have, however, been enjoyed at a considerable environmental and social cost. This has been particularly apparent in Asian countries, including Thailand, where the most intensive shrimp farming has been practised.

The further growth of the shrimp farming industry is becoming increasingly difficult. Recent warnings related to irresponsible shrimp farming activities have resulted in adverse consequences for both producers and consumers. Disease outbreaks which spread from one farm to another, the residue of antibiotics in shrimp products, and decreasing size of farmed shrimp (i.e. approaching or reaching the carrying capacity of shrimp ponds) are all examples of such warnings to producers. Consumers have also been alarmed by concerns over food safety of farmed shrimp products. Additional pressure on shrimp farming comes especially from environmental non-government organisations and media on the grounds of undesirable social consequences following the introduction of shrimp farming to local communities, in addition to the associated environmental impacts that may result. At the same time, it is still unclear whether export-oriented shrimp production provides great benefits only to large-scale producers or also to small- or local farmers in rural areas raising doubts about income distribution and poverty alleviation. Low domestic consumption of farmed shrimp has also been questioned in terms of food security for poor people. Conflicts over human rights related to land and water resources have arisen in some shrimp farming areas, as well as the use of child labour. Animal welfare has also been raised as an issue of public concern.

Unsustainable shrimp farming practices and their associated potential negative environmental and social consequences have been brought into public awareness. As a result, the environmental, social as well as ethical aspects of shrimp production methods have become important marketing factors. Certification schemes have then been developed and introduced to shrimp industry aiming to ensure the quality of shrimp products to buyers (retailers and consumers). Also, it is considered as a strategy tool to provide an incentive in shrimp production to promote a more sustainable production and consumption and thus improving the overall sustainability.



Different certification/labelling schemes have their own focus in different areas: food safety management, food quality control, environmental protection, social responsibility, or animal welfare consideration. This has led to the question whether or not there is a certification scheme that covers all relevant issues of public concern. Shrimp stakeholders in Thailand are now under pressure to adopt their production systems and pond management practices to be able to comply with the certification requirements, both national and international, in order to sustain their business and thus their own livelihoods. Shrimp farmers also echoed that the certification requirements are not practical for implementation, technically and financially. They are also concerned about the sharing of benefits among different stakeholders in the supply chain. The emergence of different certification/labelling schemes required by different "buyers" has additionally posed a threat especially to small-scale farmers whose technical and financial capacities for application and compliance might be limited. On the consumer side, it is not evident if choices are made according to the information given by certification/labelling.

In Thailand, the concept of shrimp aquaculture certification is well accepted and undertaken by the Department of Fisheries via establishing and implementing the COC (Code of Conduct for Responsible Shrimp Aquaculture) and the GAP (Good Aquaculture Practices) national certification schemes that include environmental and social issues in COC and food safety management aspects in GAP. At the same time, at least 18 certification/labelling schemes developed by non-governmental organizations or private sectors are proposed to be used in shrimp. ACC (Aquaculture Certification Council), GLOBALG.A.P. (The Global Partnership for Good Agriculture Practices), and Organic exemplify some of the existing certification schemes in the shrimp industry. The initiative of retailers to use certification has emphasised its significance in shaping the industry, both in terms of technology development as well as supply chain governance.

In this context, it is yet to be seen whether the certification schemes have improved the sustainability of shrimp industry. Therefore, it is important to understand to which degree and under which circumstances certification schemes can help improving the sustainability of shrimp aquaculture.

2. Objectives

This project aims to analyse the consequences as a result of joining or not joining different shrimp certification schemes required from importing countries to shrimp stakeholders. It is expected that the results will lead to the identification of participatory adaptation and management strategies including policy recommendations in order to sustain the competitiveness of Thai shrimp industry in the global market. The specific objectives are:



- 2.1 To analyse the structure of the shrimp supply chain including marketing routes of certified and non-certified shrimps;
- 2.2 To analyse the consequences of joining or not joining different shrimp certification schemes required from importing countries to shrimp stakeholders in terms of environmental and socio-economic sustainability; and
- 2.3 To identify the opportunities and barriers for shrimp stakeholders of joining or not joining different shrimp certification schemes required from importing countries, including the equivalency comparison of national and international certification schemes.

3. Expected outputs and outcomes

The expected outputs of this proposed project are:

3.1 Policy level

- Understanding the structure of shrimp supply chain including marketing routes of certified and non-certified shrimps
- Understanding the equivalency of national compared to international certification schemes
- Understanding the advantages and disadvantages of different certification/labeling schemes for small-scale as compared to medium- or largescale producers, including mechanisms for practical implementation

3.2 Operational level

- Understanding the environmental and socio-economic consequences of joining or not joining different shrimp certification schemes required from importing countries to shrimp stakeholders
- Understanding the attitudes of overseas buyers/consumers on certification
- Understanding the opportunities and barriers for shrimp stakeholders of joining or not joining different shrimp certification schemes required from importing countries, including decision making on entering/exiting/continuing the certification schemes

The specific expected outputs of this proposed project are:

• Comparing of different certification/labeling schemes in terms of sustainability including the attitude of shrimp stakeholders

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



- Effects of different certification/labeling schemes to different shrimp supply chains in terms of sustainability improvement
- Identify areas for sustainability improvement for both certified- (or labeled) and non-certified (or non-labeled) shrimp supply chains
- Increasing the understanding of certification schemes among stakeholders in the shrimp aquaculture industry in Thailand

In Thailand, the concept of shrimp aquaculture certification is well accepted and undertaken by the Department of Fisheries via establishing and implementing the COC (Code of Conduct for Responsible Shrimp Aquaculture) and the GAP (Good Aquaculture Practices) national certification schemes that include environmental and social issues in COC and food safety management aspects in GAP. At the same time, at least 18 certification/labeling schemes developed by non-governmental organizations or private sectors are proposed to be used in shrimp. ACC (Aquaculture Certification Council), GLOBALG.A.P. (The Global Partnership for Good Agriculture Practices), and Organic exemplify some of the existing certification schemes in the shrimp industry. The initiative of retailers to use certification has emphasised its significance in shaping the industry, both in terms of technology development as well as supply chain governance.

In this context, it is yet to be seen whether the certification schemes have improved the sustainability of shrimp industry. Therefore, it is important to understand to which degree and under which circumstances certification schemes can help improving the sustainability of shrimp aquaculture.



CHAPTER 3 Research methodology

To achieve the objectives, the proposed methodology is outlined in the conceptual framework of analysis (Figure 3-1). The framework of analysis is based on a system analysis approach and a combination of sustainability tools, along with the governance and stakeholder analysis to explore how production, distribution and consumption of shrimp products are linked and interact along the whole supply chain stretching from local people to overseas consumers. Relationships between different stakeholders and relevant institutional mechanisms will also be captured and a participatory decision conference will be organised so as to identify the sustainability indicators. Finally, the results of supply chain performance (environmental, economic, and social) will be integrated with the inputs from stakeholders in the synthesis for finding sustainable solutions for different parties. Based on the framework of analysis described, the methodology can be identified step-by-step as below.

1. Field survey of shrimp supply chains and marketing routes

1.1 Field survey of shrimp supply chains and marketing routes

Field survey of shrimp supply chains and marketing routes was conducted at the main production regions of the country: the Central, East and the South to have an overview of the shrimp clusters in different geographical areas. Sampling procedure was conducted to identify some shrimp supply chains and marketing routes were selected to focus on in this study, i.e. certified and non-certified chains with small, medium or large farms or group producers exporting to USA, Japan and EU (Figure 3-2). Certification schemes of interest in this study were: COC/GAP, ACC, GLOBALG.A.P. and Organic. Since GAP is the minimum requirement from packers, this GAP is considered as the "non-certified" supply chain (i.e. non-certified international certification schemes) compared to certified supply chains (i.e. certified international certification schemes).



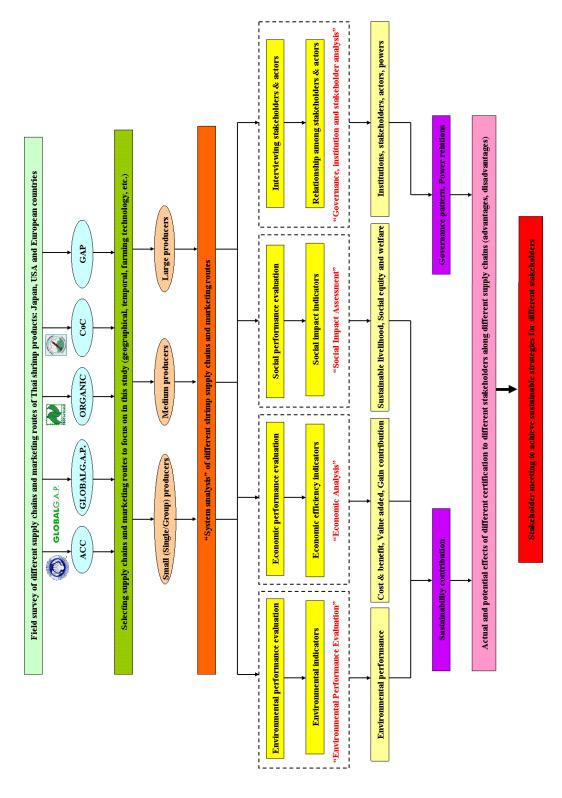


Figure 3-1 Conceptual framework of analysis used in this project



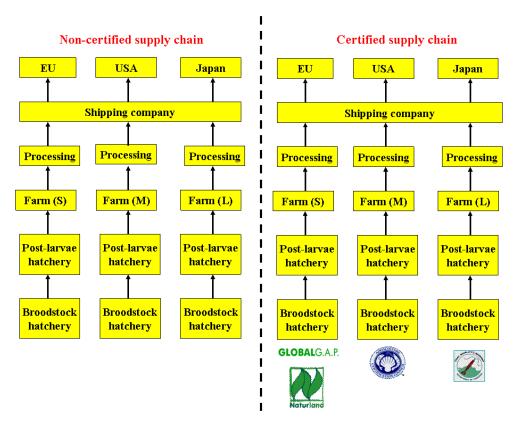


Figure 3-2 Overview certified and non-certified shrimp supply chains

1.2 Sampling procedures

The sampling procedures in this study were explained step by step as below.

(1) Farm size classification

Based on the information from DoF website and the Shrimp Network, each province was listed along with its number of GAP-certified farm and area (in rai) and corresponding productivity (ton/rai). In this case, we have 2 tables which are number of active Farm 2007 and Annual Production of Active Farm 2007. The Annual Production was used to identify the farm size into 3 sizes: Small farm (S), Medium farm (M) and Large farm (L). Using the mean and standard deviation (SD) of the total production was calculated. The results show the mean of total production is 2,371.90 ton/rai and SD is 2,521.63 ton/rai. The categories of the small, medium and large farms were developed based on the mean and SD/2.



According to the criteria, the results are:

SIZE	DECRIPTION	TOTAL NUMBER	%
Small farms	annual production is 1 – 25 tons	11,075	75.98
Medium farms	annual production is 26 – 250 tons	3,304	22.67
Large farms	annual production is over 250 tons	197	1.35
	Total	14,576	100.00

Also using the farm size definition, we can make the number of active farm based on the farm size and separate into each province that it is useful for selection sample province.

(2) Stages in Selection of Sample

(2.1) Define the target population

The 14,576 farms of the shrimp farming are the population of concern. The small, medium and large farms were categorized by provinces and the number of farms. Using probability sampling procedure in which subgroup or strata are on a basis of farm size (proportional stratified sampling).

(2.2) Determine sample size

The proportional stratified sample in which the number of sampling units drawn from each farm size is in proportion to the relative population size. We are easy to select the sample units based on the convenience of logistics, budget and time to collect the data in the fields. According to this procedure, determining the total sample size is 1 % that computed by totaling the sample size for 3 farm sizes (small = 110 farms, medium = 33 farms and large = 2 farms)

(2.3) Select actual sampling units

In the table 3-1, number of active farm separated by province with 1% of farm in each province, we can select the target province by a criteria that selected province must have farm sample at least 2 categories size. Thus, we select 19 target provinces as following in the table.

We are concerned with determining sample size for medium and large size that are not suitable to compare some results. We make add the spare sample of the medium and large sample until each the farm size = 50. With the proportional stratified sample, we conduct the random survey of 210 shrimp farms in 3 farm sizes: small size (n=110), medium size (n=50) and large size (n=50). However the random sampling in field will be based on the list of GAP and COC farm from the Provincial Fisheries Station and using the spare samples when necessary. For COC-, ACC-, Organic-certified farms, all of them



will be taken as the sample as there are not many of them. List of COC-, ACC-, Organic-certified farms is given in Tables 3-1 to 3-5.

<u>Table 3-1</u> Result of the sampling in terms of the sampled numbers of GAP farms

Region	Provinces		Farms		Total
		S	М	L	
Central	Prachuap Kirikhan	6	3	4	13
	Petchaburi	3	1	1	5
	Ratchaburi	2	1	1	4
	Samutsongkram	2	0	0	2
	Samutsakorn	6	1	0	8
	SUB-TOTAL	19	6	6	31
East	Chanthaburi	13	5	4	22
	Trad	4	1	0	6
	Rayong	2	1	0	3
	Chachengsao	25	5	3	33
	SUB-TOTAL	44	12	7	64
South	Krabi	3	4	3	10
(Andaman)	Trung	3	2	2	7
	Pang Nga	2	3	4	9
	Ranong	1	2	1	4
	Satun	3	3	4	10
	SUB-TOTAL	12	14	14	40
South	Chumporn	3	2	6	11
(Gulf of Thailand)	Nakorn Si Thammarat	15	4	2	21
	Patalung	2	1	1	3
	Songkla	11	6	5	22
	Surat Thani	4	4	9	17
	SUB-TOTAL	35	17	23	75
TOTAL		110	50	50	210



Table 3-2 List of COC farms

Region	Provinces	No. of COC farms
Central	Prachuap Kirikhan	0
	Petchaburi	3
	Ratchaburi	3
	Samutsongkram	1
	Samutsakorn	0
	SUB-TOTAL	4
East	Chanthaburi	6
	Trad	0
	Rayong	7
	Chachengsao	0
	SUB-TOTAL	13
South (Andaman)	Krabi	0
	Trung	0
	Phang Nga	2
	Ranong	4
	Satun	0
	SUB-TOTAL	6
South (Gulf of Thailand)	Chumporn	2
	Nakorn Si Thammarat	4
	Pattalung	0
	Songkla	3
	Surat Thani	0
	SUB-TOTAL	9
TOTAL		32

<u>Table 3-3</u> List of ACC-certified farms to be interviewed

Locations of ACC/Organic farms	Number
ACC farm	
Ratchaburi	1
Chumporn	5
Surat Thani	1
Krabi	1
Phang Nga	2
Satun	1
Trung	3
Chanthaburi	2
Ranong	3
Organic farm	
Chanthaburi	1



Table 3-4 List of selected ACC-certified processors to be interviewed in-depth

Locations of ACC-certified processors	Number
Chanthaburi	1
Samutsakorn	2
Songkla	1
Chumporn	1

Table 3-5 List of GAP and COC hatcheries

Region	Provinces	No. of h	No. of hatchery		
		GAP	coc		
Central	Prachuap Kirikhan	12	0		
	Petchaburi	2	0		
	Ratchaburi	0	0		
	Samutsongkram	3	1		
	Samutsakorn	0	0		
	SUB-TOTAL	17	1		
East	Chanthaburi	194	2		
	Trad	2	0		
	Rayong	8	1		
	Chachengsao	88	1		
	SUB-TOTAL	292	4		
South (Andaman)	Krabi	6	3		
	Trung	15	1		
	Phang Nga	26	6		
	Ranong	0	0		
	Satun	20	5		
	SUB-TOTAL	67	15		
South (Gulf of Thailand)	Chumporn	2	0		
	Nakorn Si Thammarat	74	1		
	Pattalung	0	0		
	Songkla	46	5		
	Surat Thani	7	0		
	SUB-TOTAL	129	6		
TOTAL (Thailand)		505	26		

In addition, some stakeholders were interviewed for their opinions about the certification's principles and criteria, the difficulties/ease of implementation, their expectations and real experiences at the hatchery and farm levels (Table 3-6). For other stakeholders, they were asked about their opinions and positions about different certifications schemes.



Table 3-6 List of shrimp stakeholders to be interviewed

Shrimp stakeholders	Number of interviewees
Feed mill	5
Local experts	5
Department of Fisheries (Central and Provincial)	10
ACC auditor	2
Buyers	2
Foreign experts	5
Organic, Naturland auditor	1
Chamber of Commerce	3
Frozen Food Association	3
Trade Association	3
Processing Plant	10
Shrimp Grower Associations	5
Workers	20
Tambon Administrative Organisation	10
Affected communities	30

(2.4) Development of questionnaires and in-depth interview guides

The conceptual framework for developing questionnaires and interview guides is to capture these following issues as a result of joining GAP, COC, ACC, or Organic certification schemes: knowledge beliefs about different certification schemes that can be influenced by regulators, promoters, buyers, NGOs, media, etc.; experiences of adopting the certification leading to the renewal or exit of license and expectations especially in terms of pricing (benefit and cost); capacity and resource required for implementation various certification (e.g. size, or level of education, financial capacity that might have an influence on this aspect). It is also within the scope of interest in this study to investigate different farm sizes, types (i.e. single or group farms) and geographical location (i.e. Central, East and South regions).

A preliminary survey of farm shrimps was conducted in order to have better ideas on the current situation in terms of farm management practices, monitoring and maintenance for compliance, including marketing structure and routes of both certified and non-certified shrimp products. The information gained from field visits were used to support the development of questionnaires and in-depth interview guides.

The scope of questions was developed to cover the environmental, social and economic aspects including the general opinions about certification, which are:

- (1) Environmental aspects
 - a. Location of farms
 - b. Change of land use



- Farm layout and facilities (e.g. site entry, water-storage pond, sediment-storage pond, inlets and outlets, chemical storage room, feed storage room)
- d. Farm management practices (e.g. post-larvae, water, chemical, feed, energy, and management practices of special conditions such as disease infection, mass mortality, and sludge/wastewater management)
- e. Data recording & documentation (e.g. land title, Movement Document, PCR test report, Recording of farm management practices, Farm manual)
- (2) Economic aspects
 - a. Marketing routes
 - b. Production cost structure
 - c. Cost for improving the farm to be in compliance
 - d. Cost for maintaining the license
- (3) Social aspects
 - a. Working conditions (including the facilities for safety)
 - b. Relation between workers and farm owners
 - c. Social welfare
- (4) Opinions about certification
 - a. Implementation to comply with the certification's criteria
 - i. What did you have to do?
 - ii. Was it difficult/easy?
 - iii. How much did you invest?
 - b. Changes after being certified
 - i. Environmental management system
 - ii. Economic performance Social welfare
 - c. Certification procedure
 - i. Certification principles and criteria
 - ii. Certification procedure
 - iii. Roles of institutions
 - d. Expectation & Real experiences
 - i. Expectations
 - ii. Real experiences

2. Assessment of environmental and socio-economic consequences

In this stage, the selected shrimp supply chains will be systematically analysed in all aspects so as to identify the associated sustainability issues. A combination of tools will be applied to evaluate the sustainability of different shrimp supply chains in terms of environmental, social and economic performances. Roles of stakeholders/actors in



relation to the governance patterns and institutional mechanisms driving the market and trade will also be explored to understand better the interconnected network. The methodology proposed to be used in this study is briefly explained below.

2.1 Environmental performance evaluation

The environmental performance of certified and non-certified farms, including the environmental improvement as a result of converting/joining one or more international certification schemes, will be evaluated both in qualitative and quantitative terms. A checklist of environmental performance indicators will be prepared based on the environmental system analysis approach, applying the concept of several environmental management tools. EIA (Environmental Impact Assessment), EMS (Environmental Management Systems), and LCA (Life Cycle Assessment) exemplify such tools. The qualitative and quantitative environmental performance of certified and non-certified farms will be integrated using scoring systems, using the distance-to-target approach to analyse the gap between the current status to the compliance to certification criteria. The environmental performance of certified and non-certified farms can then be compared accordingly.

2.2 Economic analysis

The economic analysis will be conducted by using Value Chain Analysis (VCA), which is the tool to analyse values along the whole supply chain. VCA will be applied to each stakeholder in the shrimp supply chain: suppliers, farms, marketing channels, processors, and consumers to understand the maximum cost to operate their activities. First, supporting activities e.g. arrangement, technology development, human resource management and basic structure for the industry in interconnected sub-supply chains will be analysed. After that, value analysis in each sub-supply chain in terms of costs and benefits will be assessed so as to determine the profit level of each production activities in sub-supply chains and how they are linked. In addition to VCA, Cost-Benefit Analysis (CBA) will be applied to evaluate the distribution of profit both in monetary and non-monetary terms stretching from producers in Thailand to consumer in overseas countries. The profit of certified and non-certified shrimp supply chain will be thoroughly analysed and compared. The data will be collected by using questionnaires and cost-benefit collection sheet including the environmental and social consequences.

2.3 Social analysis

The social analysis will be performed by using a combination of social tools: semi-structured in-depth interviews to assess the social impacts in qualitative terms and questionnaire to evaluate the social impacts at the farm level, together with statistical analysis. The social consequences of certified and non-certified farms will be compared. With respect to the semi-structured in-depth interview, farm owners/managers, workers as well as people living in communities nearby shrimp farms will be interviewed. Apart from that, the interviews of suppliers, packers, buyers, and certification developers will also be conducted to collect their views on the effects of



certification implementation to local livelihood and farm management practices. Field observations as well as documentation and farm manual reviewing will also be conducted. This will be done in parallel with the data collection on marketing relationship as well as governance issues. The data collection for social impacts of noncertified farms will cover at least 100 farms so as to achieve sufficient information to analyse opportunities and barriers of each farm type and size. Examples of the data to be collected are: type of labours, working hours, stress from working, relation with family, safety, gender relation, emotion, responsibility, power, access to credit, risk distribution as well as Corporate Social Responsibility and conditions to access certification. The data collected from interviews will be analysed by coding using the NVIVO software.

2.4 Chain governance and institutional analysis

Different certification/labeling schemes will be examined in terms of certification development and associated institutions including the participation of affected local communities/stakeholders. Chain governance of different certification schemes will be thoroughly analysed so understand the power relations of different market players and its effects to interconnected supply network in terms of position, profit, resource and power. Politics and driving factors influencing the chain governance will also be inspected, to understand the characteristics of the supply network. The transparency, risk management, responsibilities and practices to be in compliance with certification criteria of associated institutions by using at least 30 in-depth interviews will also be performed by using discourse analyses.

3. Identification of opportunities & barriers

The results of environmental and socio-economic consequences as well as institution/governance analysis will be integrated to identify opportunities & barriers for each stakeholder as a result of joining or not joining different international certification schemes.

4. Stakeholder meeting

The results from this study will be shared with shrimp stakeholders along the whole supply chain at a stakeholder meeting to gather their opinions, which could lead to some solutions on adaptation strategies in terms of production planning as well as marketing mechanisms with support from associated institutions. The expected outcome is to deliver some policy recommendations regarding production planning, marketing, management mechanisms for a better management and competitiveness for sustainable Thai shrimp industry.

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



5. Synthesis

Synthesis of the suitability and potential of different certification/labeling schemes for small-scale as compared to medium- or large-scale producers with different social responsibility and environmental protection business objectives including mechanisms for practical implementation will be derived accordingly.



CHAPTER 4 BENCHMARKING OF SHRIMP CERTIFICATIONS

1. Benchmarking methodology

Scope of benchmarking

The aim of benchmarking is to evaluate the equivalency of different certification schemes, including identification their similarities and differences.

Selection of certifications for benchmarking

The certifications selected for benchmarking exercise in this study were the main certification schemes have been applying and potentially to be applied in Thailand, which are:

- Thai GAP
- Thai COC
- ACC
- Organic, Naturland
- GLOBALG.A.P.
- FAO Technical Guideline

Benchmarking criteria and assessment method

To assess the equivalency of different certification schemes, the criteria of each certification schemes will be compared against the criteria of GLOBALG.A.P. as the most comprehensive level of certification. The benchmarking criteria were:

- Scope of interest in each certification
 The scope of interest in each certification will be determined by classifying each clause (criterion) in terms of relevance to the area of interest, which was primarily divided into 5 main areas environmental impacts, social responsibility, food safety and quality, animal health and welfare, and traceability. Relative score will be determined by calculating the proportion of number of criteria in
- Applicability of certification criteria
 The applicability of certification criteria will be assessed by evaluating each criterion if there is any guidance to indicate practical implementations, expressed as score as follow:

each area as compared to the total number of criteria



Applicability score = 10	Principles with clear guidance on
	implementation (such as quantitative
	indicators, list of required documents, etc.)
Applicability score = 5	Principles with unclear guidance on
	implementation (such as qualitative
	indicators)
Applicability score = 3	General principles with some explanation
	on implementation but not in terms of
	assessment method or criteria of
	compliance
Applicability score = 0	General principles only with no explanation
	on implementation

• Benchmarking assessment

The benchmarking assessment will be evaluated by assessing the level of relevance (i.e. degree of criteria matching) against the defined benchmarking criteria defined "clause-by-clause" as below.

GLOBALG.A.P. as the benchmarking criteria GLOBALG.A.P. & Thai GAP GLOBALG.A.P. & Thai COC GLOBALG.A.P. & ACC GLOBALG.A.P. & Organic

ACC as the benchmarking criteria
ACC & Thai GAP
ACC & Thai COC

The score of benchmarking assessment will be given as:

Benchmarking score = 10	The certification criteria fully equivalent with				
	the benchmarking criteria				
Benchmarking score = 5	The	certification	criteria	highly	equivalent
	with the benchmarking criteria				
Benchmarking score = 3	The	certificatio	n crit	eria	moderately
	equivalent with the benchmarking criteria				
Benchmarking score = 0	The certification criteria do not address at al			ddress at all	
	the benchmarking criteria, or vice versa			versa	

Results of benchmarking

In each benchmarking criteria, the scoring systems were:



- Scope of interest in each certification
 - The results will be presented as the relative score in percentage:
 - % Scope of certification in environmental impacts
 - % Scope of certification in social welfare and responsibility
 - % Scope of certification in food safety and quality
 - % Scope of certification in animal health and welfare
 - % Scope of certification in traceability
- Applicability of certification criteria

The results will be presented as the total applicability score:

- Total applicability score
- = Summation of applicability score from all criteria
- Benchmarking assessment

The results will be presented as the relative score:

Relative benchmarking score

= Summation of benchmarking score from all criteria / ($10 \times the total$ number of benchmarking criteria)

2. Benchmarking results

2.1 Scope of certification

All certifications cover the five main areas: environmental impacts, social welfare and responsibility, food safety and quality, animal health and welfare, and traceability. However, the focus of different certifications schemes varies with some giving more emphasis to some areas than others. The comparison of different certifications showed that GLOBALG.A.P. is the most comprehensive certification scheme with the highest number of criteria (246 criteria) among all schemes being considered in this study (GLOBALG.A.P., ACC, Organic - Naturland, Thai COC and Thai GAP). In all certifications the highest number of criteria are for environmental issues (Table 4-1). GLOBALG.A.P. and Organic schemes both emphasize on animal health and welfare more than other schemes. Traceability in GLOBALG.A.P. and Thai GAP is given more importance than the others.



Table 4-1 Scope of shrimp certification criteria

Scope	Number of criteria (%)				
	Thai GAP	Thai COC	Organic, Naturland	ACC	GLOBALG.A.P.
Environmental impacts	17 (31%)	29 (45%)	28 (39%)	17 (37%)	76 (31%)
Social welfare and responsibility	9 (16%)	12 (18%)	14 (19%)	10 (22%)	51 (21%)
Food safety and quality	15 (27%)	15 (23%)	17 (24%)	15 (33%)	41 (17%)
Animal health and welfare	6 (11%)	6 (9%)	12 (17%)	0 (0%)	36 (15%)
Traceability	8 (15%)	3 (5%)	1 (1%)	4 (9%)	42 (17%)
Total number of criteria	55	65	72	46	246

Environmental criteria

The common environmental criteria are related to the site selection, use of resources, storage of feed and chemicals, effluent and sediment management, and waste management. However, GLOBALG.A.P. emphasizes more on the issues of quality manual that should contain environmental policy, the procedure of environmental and risk management systems based on Environmental Impact Assessment (EIA) and Risk Assessment (RA). COC requires the farm manual, but the details are much less without the requirement of conducting EIA and RA studies. The international principles and Organic both requires for non-GMO ingredients (notes that the requirement of non-GMO ingredients is being debated and not yet finalized for the international principles). The criteria of international principles are clearer in terms of indicators, such as kWh/kg of shrimp produced or FFER. But the criteria of other schemes are rather general without giving guidance on practical approaches except for GLOBALG.A.P. that indicates the assessment of verification rather clearly.

Social criteria

All certifications include worker safety and employee relations. However, only ACC, Thai GAP and Thai COC cover the community relation issues. The access of resource is in all certification schemes, except the international principles. The use of right for land and water are only in ACC and GLOBALG.A.P. schemes but not in the others.

Food safety criteria

GLOBALG.A.P. and ACC emphasize a good quality of water not to compromise the food safety while GAP and COC includes the proper storage of chemicals and feeds. The requirement on a proper source of feed ingredients is included in GLOBALG.A.P.,



Organic, Thai GAP and Thai COC. The use of antibiotic is common among ACC, Organic and Thai COC.

Food quality criteria

GLOBALG.A.P. covers the quality of ice while ACC and Organic includes the temperature control of harvested shrimps, and the cleanness of equipment.

Animal health and welfare criteria

All certification schemes specify the limited stocking density except for ACC. The requirement for RA is only applied in GLOBALG.A.P. but not the others. The international principles are concerned about the stress control during transport, but not the others.

Traceability criteria

The record of movement is required in GLOBALG.A.P., Thai GAP and Thai COC. The record of feed supplier is additionally required in GLOBALG.A.P. The data recording systems are needed in GLOBALG.A.P. and Thai COC.

2.2 Benchmarking assessment results

(1) GLOBALG.A.P. & Thai GAP

The benchmarking scores of GLOBALG.A.P & Thai GAP (Details of equivalent criteria re given in Table 4-2) are:

•	All farm-base module	17.78 %
•	All aquaculture-base module	30.61 %
•	Shrimp-species module	30.30 %
•	Social module	42.86 %
•	Average	25.20 %

All farm-base module

Out of 45 criteria, only 8 criteria of Thai GAP are matching with GLOBALG.A.P. – 7 criteria are fully equivalent and 1 criterion is highly equivalent. Several issues addressed in GLOBALG.A.P but not in Thai GAP, particularly to the farm management systems related to risk assessment, internal self-assessment, environmental and biodiversity plan.

All aquaculture-base module

Out of 147 criteria, only 45 criteria of Thai GAP are matching with GLOBALG.A.P. - 38 criteria are fully equivalent and 7 criteria are highly equivalent. Chemical, medicine, fish health and welfare, energy efficiency, waste, waster usage and disposal, are harvesting

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



are the key areas that are highly equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not GLOBALG.A.P., which are:

- 1.3 Farms recommended to be easily accessible to road or any transportation
- 3.2 If authorized drug or chemical is applied, withdrawal period must be strictly performed or restriction of use according to the instruction
- 2.9 Efficient feed management
- 2.7 Aerator positioned correctly and operated efficiently
- 5.4 Safety electricity system should be provided
- 6.4 Untreated animal manure must not be used

The criteria that are moderately equivalent are related to the veterinary plan, and the salinization that should inform competent body and local communities.

Shrimp-species module

Out of 33 criteria, only 10 criteria of Thai GAP are matching with GLOBALG.A.P. – all matching criteria are fully equivalent. The key areas that are not addressed in Thai GAP but in GLOBALG.A.P. are mainly related to hatchery activities, as Thai GAP has another set of criteria applied for hatcheries.

Social module

Out of 21 criteria, only 9 criteria of Thai GAP are matching with GLOBALG.A.P. – 6 criteria are fully equivalent, 2 criteria are highly equivalent and 1 criterion are moderately equivalent. The main non-equivalent criteria are related to the workers' right such as working time, freedom to join labor organization, communication with managers, and equity principle of employment conditions.

However, there are additional 2 criteria that are covered in Thai GAP but not in GLOBALG.A.P., which are mainly related to the forming of shrimp farms for exchanging experiences and attending training related environmental friendly shrimp culture techniques:

- 9.3 Shrimp farmer is recommended to apply to be membership of group/club/association which related to the profession
- 9.4 Shrimp farmer is recommended to participate to seminar and/or training on related environmental friendly shrimp culture techniques



<u>Table 4-2</u> Benchmarking results of GLOBALG.A.P. & Thai GAP

GLOBALG.A.P.	Thai GAP	Benchmarking score
ALL FARM-BASE MODULE: AF		
AF . 1 . 1 All records requested kept for a minimum period of time of two years	10.3 Records of all relevant data of inputs and outputs should be available for the inspection	10
AF . 2 . 1 . 1 A recording system established for each unit of production	10.3 Records of all relevant data of inputs and outputs should be available for the inspection	10
AF . 3 . 2 . 3 All workers received adequate health and safety training	8.5 Shrimp farm is recommended to provide adequate training on work safety practices	10
AF . 3 . 2 . 6 All persons working on the farm received basic hygiene training	8.5 Shrimp farm is recommended to provide adequate training on work safety practices	10
AF . 3 . 4 . 1 Workers (including subcontractors) equipped with suitable protective clothing in accordance with legal requirements	8.4 Shrimp farm is recommended to provide enough and safety equipments for farm work	10
AF . 3 . 5 . 4 Workers have access to clean food storage areas	8.3 Shrimp farm is recommended to provide appropriated worker and welfare	10
AF . 3 . 5 . 5 Living quarters habitable and have the basic services and facilities	8.3 Shrimp farm is recommended to provide appropriated worker and welfare	10
AF . 5 . 1 . 2 Producer considered how to enhance the environment for the benefit of the local community	9.2 Shrimp farm is recommended to provide support and assist to the local community	5
ALL AQUACULTURE -BASE MODULE: AB		
AB . 1 . 1 . 1 Quality manual	2.1 Farm must have and operate according to operational manual	5
AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare	1.1 Farms not exposed to environment risk that can affect shrimp health and safety of	10
	consumer 1.2 Farms located closed to good source of water	10
AB . 1 . 2 . 8 Do not drain effluent into stagnant water or cause erosion	4.2 Shrimp farm effluent should not be discharged unless it was treated before discharge	5
AB . 1 . 2 . 12 Written procedure for	2.3 Resting and/or preparation of	10



n and navitina dus.		
pond routine dry out	pond before start the next crop	4.5
AB . 2 . 1 . 1 Chemicals stored in	3.3 Authorized drugs, chemicals and	10
accordance with the label	probiotics stored in an appropriate	
instructions and legislation	manner	10
	5.3 Lubricant is recommended to	
	disposed or eliminated in a	10
	responsible manner	
	7.2 Using of authorized chemical in	
	the appropriate manner	
AB . 2 . 1 . 6 Chemical store shelves	5.1 Fuel and lubricant should be	10
made of non-absorbent material	stored safety and in a responsible	
	manner	
AB . 2 . 1 . 7 Chemical store able to	5.1 Fuel and lubricant should be	10
retain spillage	stored safety and in a responsible	
	manner	
AB . 2 . 1 . 12 Powders stored on	5.1 Fuel and lubricant should be	10
shelves above liquids	stored safety and in a responsible	
	manner	
AB . 2 . 2 . 1 Empty chemical	6.1 Used drug/ chemical containers	10
containers not re-used	should be disposed of in a	
	responsible manner in order to	
	prevent contamination	
AB . 2 . 2 . 4 Empty containers kept	6.1 Used drug/ chemical containers	10
secure until disposal	should be disposed of in a	
·	responsible manner in order to	
	prevent contamination	
AB . 3 . 1 Control risk of pest	6.5 No pet should be allowed in the	5
infestation in buildings	production area of the farm	
AB . 3 . 3 Prevent ingress of animal	6.2 Shrimp farm should provide	10
pests	appropriate hygienic garbage	
	management and pest control	
	6.5 No pet should be allowed in the	
	production area of the farm	10
AB . 4 . 1 . 2 Training workers on	8.5 Shrimp farm is recommended to	10
_	provide adequate training on work	10
hygiene standards	safety practices	
AB . 4 . 2 . 1 Workers have access to		10
	8.3 Shrimp farm is recommended to	10
toilets, eating facilities and potable	provide appropriated worker and welfare	
water		10
AB . 5 . 1 . 1 Registered products	10.1 Shrimp fry movement document	10
traceable back to registered farms	(FMD) and movement document	
AD 5 4 25 1 1 1 1 1 1 1	(MD)	40
AB . 5 . 1 . 2 Fish traceable to the	10.1 Shrimp fry movement document	10
farm of hatching	(FMD) and movement document	
	(MD)	
AB . 5 . 2 . 1 History and current	2.13 Routine monitoring of shrimp	5



overview of fish health status	health	
	2.14 In case of poor health, disease	5
	should be diagnosed, the cause and	
	measure should be made	
AB . 5 . 2 . 3 Veterinary health plan	2.15 Availability of prevention	5
, .	measure and efficiently disease	
	outbreak control plan	
AB . 5 . 2 . 6 Notify the relevant	2.16 In case of disease outbreak	10
competent authority of any disease	should be inform to the control	
, ,	authority	
AB . 5 . 2 . 10 Stocking density not	2.4 Stocking of shrimp larvae at the	10
exceed the maximum load	appropriate density	
AB . 5 . 2 . 11 Water quality	2.2 Measurement of quality in source	10
monitoring program	water according to the operation	10
monitoring program	manual	
AB . 5 . 2 . 12 Fish treated and	2.11 Routine analysis of water	10
handled to protect them from pain,	qualities in shrimp culture pond	10
stress, injury and disease	quantities in similip culture pena	
AB . 5 . 3 . 1 Use approved	3.1 Not use banned and unregistered	10
medicines	veterinary drugs, chemical,	10
medicines	hazardous materials and probiotics	
	drugs	
AB . 5 . 3 . 3 Not use natural,	7.2 Using of authorized chemical in	10
synthetic hormones or antibiotic	the appropriate manner	10
agents	the appropriate manner	
AB . 5 . 4 . 1 Recorded legal	10.2 Record of veterinary drug,	10
medicine purchase	chemical, hazardous materials and	10
meaner parenass	probiotics	
AB . 5 . 8 . 3 Harvesting and	7.1 No prohibited chemicals used	10
transport undertaken in a way that	during shrimp harvest	
does not to compromise food	7.4 Harvest should be done in a good	10
safety	manner	10
AB . 5 . 9 . 2 Recorded machinery	5.2 Mechanical machine used in farm	10
and equipment of calibration and	should be in good condition without	
maintenance	leakage of fuel or lubricant in to	
	source water	
AB . 6 . 1 . 2 Compound feed	2.8 Used certified feed and not	10
obtained from an appropriate	expire feed. On-site feed production	
source	must declare list of materials and	
	must not use the prohibited	
	materials	
AB . 6 . 2 . 5 Feed consumed before	2.8 Used certified feed and not	10
shelf life expires	expire feed. On-site feed production	
	must declare list of materials and	
	must not use the prohibited	
	materials	
		1



AB . 6 . 3 . 1 Feed stored and produced in accordance with good practice	2.10 Feed stored in the safety place that be able to prevent the contamination and maintain quality of feed	10
AB . 7 . 1 . 7 Competent authorities and local communities been informed when salinization	4.3 Shrimp farm should prevent environmental impact of discharged saline water on freshwater/agricultural area	5
AB . 7 . 2 . 1 Measures to optimize energy use and minimize waste	5.5 Shrimp farm should provide measure on energy saving and alternative energy sources	10
AB . 7 . 3 . 1 All human solid wastes from toilets collected and disposed without contamination	6.3 Good hygienic toilet , avoid contamination of domestic sewage into grow-out pond, reservoir and canal	10
AB.7.5.1 Predator control to present unnecessary wildlife destruction	2.12 Prevention of predators and disease carriers to entering the ponds	10
	2.6 Water filtering system installed to prevent the entering of shrimp predators to farm	10
AB . 8 . 1 . 1 Water abstraction and discharge meet the requirements	4.1 Effluent qualities must meet the national effluent standard for aquaculture farm	10
AB.8.1.3 Water quality monitored of discharged water and/or recipient water body	4.2 Shrimp farm effluent should not be discharged unless it was treated before discharge	10
AB . 8 . 1 . 5 Sludge disposed of in an appropriate manner	4.4 Sludge from shrimp farm should not be discharged into public or non-permitted area	10
SHRIMP-SPECIES MODULE: SP		
SP . 1 . 2 . 2 Nauplii and post larvae purchased from certified hatchery	2.5 Availability of record/ certification/ test report of larval health	10
SP . 1 . 2 . 4 Nauplii or post larvae provide analytical tests certificates	SP . 1 . 2 . 4 Nauplii or post larvae provide analytical tests certificates	10
SP . 1 . 3 . 1 Incoming water disinfected to destroy pathogens	2.12 Prevention of predators and disease carriers to entering the ponds	10
SP . 2 . 2 . 1 Al in all out	10.3 Records of all relevant data of inputs and outputs should be available for the inspection	10
SP . 4 . 1 . 1 Temperature of the shrimp at harvesting reduced as	7.3 Use certified buyer / collector registered with Department of	10



quickly	Fisheries	
SP . 4 . 1 . 2 Shrimps protected to	7.3 Use certified buyer / collector	10
prevent heat, losses and cross	registered with Department of	
contamination	Fisheries	
SP . 4 . 1 . 3 Shrimps placed in clean	7.3 Use certified buyer / collector	10
and disinfected bins and ice added	registered with Department of	
	Fisheries	
SP . 4 . 2 . 1 Traceability of the	10.3 Records of all relevant data of	10
harvested pond maintained up to	inputs and outputs should be	
the process line	available for the inspection	
SP . 5 . 1 New pond not been	1.6 Farms must be located outside	10
established within a designated	mangrove and/or conserved	
national Protected Area	wetlands	
SP . 5 . 2 New pond, farm site or	1.7 Farms must be located outside	10
related facilities not been	the prohibited areas/zone as	
established (before April 2008)	indicated by law.	
SOCIAL CRITERIA MODULE: SC		Benchmarking
		score
SC 1 . 2 . 1 Responsibility for	8.1 Legal worker employment must	10
workers' health, safety and good	be performed	
social practice	8.3 Shrimp farm is recommended to	10
	provide appropriated worker and	
	welfare	
	8.4 Shrimp farm is recommended to	10
	provide enough and safety	
	equipments for farm work	
	8.5 Shrimp farm is recommended to	10
	provide adequate training on work	10
	safety practices	
SC 1 . 2 . 14 Farm pay a living wage	8.2 Legal worker wages must be	10
according to UNDP statistics	applied	
SC 2 . 1 Owner has a legal land title	1.4 Farms registration with	3
to the land where aquaculture	Department of Fisheries	
takes place	1.5 Farms have title to land or own	10
	legal rights for land use	
SC 2 . 2 Participatory social impact	9.1 Shrimp farm must not block the	5
assessment and sufficient	traditional access route to public	
compensation	resources and/or disturb traditional	
	lifestyle	
	9.2 Shrimp farm is recommended to	5
	provide support and assist to the	
	local community	



(2) GLOBALG.A.P. & Thai COC

The benchmarking scores of GLOBALG.A.P & Thai COC (Details of equivalent criteria re given in Table 4-3) are:

•	All farm-base module	15.56 %
•	All aquaculture-base module	40.14 %
•	Shrimp-species module	39.39 %
•	Social module	19.05 %
•	Average	33.74%

All farm-base module

Out of 45 criteria, only 7 criteria of Thai COC are matching with GLOBALG.A.P. – 6 criteria are fully equivalent and 1 criterion is moderately equivalent. Several issues addressed in GLOBALG.A.P but not in Thai COC, particularly to the farm management systems related to risk assessment, internal self-assessment, environmental and biodiversity plan and Training related to record of training activities, health and safety training.

All aquaculture-base module

Out of 147 criteria, only 59 criteria of Thai COC are matching with GLOBALG.A.P. – 49 criteria are fully equivalent, 5 criteria is highly equivalent and 5 criterion are moderately equivalent. Site management, chemical, medicine, fish health and welfare, medicine, aquaculture feed, energy efficiency, waste, waster usage and disposal are the key areas that are highly equivalent. Some specific issues to those equivalent criteria are also addressed in Thai COC, but not GLOBALG.A.P., which are:

- 3.1 Stocking density based on culturing technique, target, survival rate and size
- 3.2 Stocking density based on larval quality, size and age
- 3.3 Stocking density based on pond capacity
- 4.3 Farm has efficient feed management
- 4.4 Farm uses fresh feed when necessary and with good management practices
- 4.5 Farm uses medicated feed correctly, when necessary
- 4.6 Farm calculates amount of feed given daily and FCR

The criteria that are moderately equivalent are related to the Quality manual, workers facilities, maximum residue limit, testing feed contaminate and organic waste.

Shrimp-species module

Out of 33 criteria, only 13 criteria of Thai COC are matching with GLOBALG.A.P. – 7 criteria are fully equivalent, 5 criteria are highly equivalent and 1 criterion is moderately equivalent. The key areas that are not addressed in Thai COC but in GLOBALG.A.P. are water supply, frequency mortality, hygienic and pest control and feed at hatchery. Some



specific issues to those equivalent criteria are also addressed in Thai COC, but not GLOBALG.A.P., for instance:

8.4 In case of hiring harvesters, shrimp farms should ensure no prohibited chemicals are used during harvesting

Social module

Out of 21 criteria, only 4 criteria of Thai COC are matching with GLOBALG.A.P. - 4 criteria are fully equivalent. The main non-equivalent criteria are related to the workers' right such as working time, freedom to join labor organization, communication with managers, and equity principle of employment conditions.

However, there are additional 1 criteria that are covered in Thai COC but not in GLOBALG.A.P., which are mainly related to use local worker include farm facility and located of shrimp farming.

<u>Table 4-3</u> Benchmarking results of GLOBALG.A.P. & Thai COC

GLOBALG.A.P.	Thai COC	Benchmarking score
ALL FARM-BASE MODULE	FARM	
AF . 1 . 1 All records requested kept for a minimum period of time of two years	1.1 Farms with land title or at least 2 years of renting from land owner/government	10
	1.7 Farm registered with the competent authority	3
	4.6 Farm calculates amount of feed given daily and FCR	10
	6.3 Farm record the chemical use	10
AF . 2 . 1 . 1 A recording system established for each unit of	1.7 Farm registered with the competent authority	3
production	4.6 Farm calculates amount of feed given daily and FCR	3
	6.3 Farm record the chemical use	3
AF . 3 . 5 . 5 Living quarters habitable and have the basic	7.10 Farm has sanitary systems for workers	10
services and facilities	9.7 Farm should provide worker welfare and living condition	10
AF . 4 . 2 . 2 This waste management plan been implemented	7.13 Farm evaluates waste management system and continuously improves	10
AF . 4 . 2 . 4 Premises have adequate provisions for waste disposal	7.11 Farm dispose wastes and sewage correctly	10
AF . 5 . 1 . 1 Producer have a	2.9 Farm have predator control not	10



	T	
management of wildlife and	harmful to importance species for	
conservation plan	ecological values	
AF . 5 . 1 . 2 Producer considered	9.3 S Farm supports local community in	10
how to enhance the environment	environmental conservation, public	
for the benefit of the local	health, safety and education	
community		
AF . 5 . 1 . 3 Policy compatible with	7.8 Farm not discharge water to fresh	3
sustainable commercial agricultural	water and agriculture area	3
production	water and agriculture area	
-	1.2 Farm lacated cutside the manager	5
AF . 5 . 1 . 5 the plan include action	1.2 Farm located outside the mangrove	5
to avoid damage and deterioration	and consider carrying capacity of land	
of habitats	2.8 Farm with water filtering system	
	installed to prevent the entering of	10
	shrimp predators to farm	
	2.9 Farm have predator control not	5
	harmful to importance species for	
	ecological values	10
	7.8 Farm not discharge water to fresh	
	water and agriculture area	
AF . 5 . 1 . 6 The plan include	9.2 Farm participates mangrove	10
activities to enhance habitats and	plantation program, good relation/no	
increase biodiversity	impacts on local community	
AF . 7 . 1 All producers have a	11.Traceability	10
1 / 1 · / · ± All producers have a	II. Haceability	10
	11. Haceability	10
documented recall procedure to	11. Haceability	10
documented recall procedure to manage the withdrawal of	11. Haceability	10
documented recall procedure to manage the withdrawal of registered products	11. Haceability	10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE		
documented recall procedure to manage the withdrawal of registered products	9.8 Farm should have farm	3
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual	9.8 Farm should have farm management policy	3
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-	
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water	3 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential	3
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources	3 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and	3 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion	3 10 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion 7.12 Farm has management system	3 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other facilities maintained in good repair	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion 7.12 Farm has management system accordance with legislations	3 10 10 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other facilities maintained in good repair AB . 1 . 2 . 4 Precautions to prevent	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion 7.12 Farm has management system accordance with legislations 7.1 Farm should canals and	3 10 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other facilities maintained in good repair	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion 7.12 Farm has management system accordance with legislations	3 10 10 10 10
documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE AB . 1 . 1 . 1 Quality manual AB . 1 . 2 . 1 Water quality does not compromise food safety and animal health & welfare AB . 1 . 2 . 2 Farms and other facilities maintained in good repair AB . 1 . 2 . 4 Precautions to prevent erosion	9.8 Farm should have farm management policy 1.3 Farm located in an area of good-quality water 1.5 Farms not located near potential pollution sources 7.1 Farm should maintain canals and embankments to reduce erosion 7.12 Farm has management system accordance with legislations 7.1 Farm should canals and embankments to reduce erosion	3 10 10 10 10 10
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flandalala		
floods levels	045	
AB . 1 . 2 . 7 Vegetative buffer	2.1 Farm with good layout according to	5
zones and habitat corridors	technical requirements	
AB.1.2.9 Design and	2.1 Farm with good layout according to	5
construction of site support the	technical requirements	
biodiversity plan	045	
AB . 1 . 2 . 10 Infrastructure support	2.1 Farm with good layout according to	5
in case of infectious disease	technical requirements	
outbreak	7.40	
AB . 1 . 2 . 11 Waste management	7.13 Farm evaluates waste	10
system	management system and continuously	
	improves	
AB . 1 . 2 . 12 Written procedure for	2.7 Farm maintain pone bottom, sludge	10
pond routine dry out	removal is done properly	
AB . 2 . 1 . 1 Chemicals stored in	2.4 Farm use fertiliser, limes and	10
accordance with the label	chemical in a responsible manner	
instructions and legislation		40
AB . 2 . 1 . 5 Chemicals stored in	6.4 Farm stores chemical properly,	10
their original packaging	dispose in a responsible manner	40
AB . 2 . 1 . 6 Chemical store shelves	6.4 Farm stores chemical properly,	10
made of non-absorbent material	dispose in a responsible manner	10
AB . 2 . 1 . 7 Chemical store able to	6.4 Farm stores chemical properly,	10
retain spillage	dispose in a responsible manner 7.4 Farm should store fuel and	40
		10
	lubricant safely and in a responsible manner	
AB . 2 . 1 . 12 Powders stored on	6.4 Farm stores chemical properly,	10
shelves above liquids	dispose in a responsible manner	10
AB . 4 . 2 . 1 Workers have access to	7.10 Farm has sanitary systems for	3
toilets, eating facilities and potable	workers	J
water	WOINCIS	
AB . 4 . 3 . 3 Registration farm with	1.7 Farm registered with the	10
competent authority	competent authority	10
AB . 5 . 2 . 1 History and current	2.5 Farm monitor and manage shrimp	10
overview of fish health status	health	10
overview of fish ficaltif status	5.1 Farm monitor shrimp heath and	10
	water quality in ponds regularly	10
AB . 5 . 2 . 3 Veterinary health plan	5.2 Farm has measures to prevent	10
y recentary ficular plan	disease outbreak from pond	10
	management	
	5.3 Farm have measure to prevent	10
	diseases spread within farm	10
AB . 5 . 2 . 9 Correct feeding	4.3 Farm have efficient feed	10
quantities used	management	
AB . 5 . 2 . 10 Stocking density not	2.2 Farm maintain water quality,	10
exceed the maximum load	stocking density not exceed capacity,	
	1	



	use good-quality feed and effective	
	feeding management	
AB . 5 . 2 . 11 Water quality	5.1 Farm monitor shrimp heath and	10
monitoring program	water quality in ponds regularly	
AB . 5 . 2 . 12 Fish treated and	5.2 Farm has measures to prevent	10
handled to protect them from pain,	disease outbreak from pond	
stress, injury and disease	management	
AB . 5 . 3 . 1 Use approved	6.1 Farm used veterinary drugs and	10
medicines	chemicals based on instructions,	
	withdrawal period, storage and	
	disposal	
	6.5 Farm uses veterinary drugs and	10
	chemical used accordance with the	
	instructions by government and	
	national standard	
AB . 5 . 3 . 2 Demonstrate	6.2 In case of using harmful chemical,	3
compliance regarding Maximum	draining water after chemical	
Residue Limit	disintegrate	
AB . 5 . 3 . 5 Medicines disposed in	6.1 Farm used veterinary drugs and	10
a manner agreed by veterinarians	chemicals based on instructions,	
	withdrawal period, storage and	
	disposal	
AB . 5 . 4 . 1 Recorded legal	6.3 Farm record the chemical use	10
medicine purchase		
AB . 5 . 6 . 2 Contingency plan for	5.3 Farm have measure to prevent	10
severe disease episode	diseases spread within farm	
AB . 5 . 8 . 3 Harvesting and	8.6 Shrimp farms should encourage	10
transport undertaken in a way that	freshness control and clean ice	
does not to compromise food		
safety		
AB . 6 . 1 . 1 Suitable diet for the	4.1 Farm use good-quality feed, freshly	10
species farmed	produced, and not expire	
AB . 6 . 1 . 2 Compound feed	4.1 Farm use good-quality feed, freshly	10
obtained from an appropriate	produced, and not expire	
source		
AB . 6 . 2 . 4 List of all antibiotics,	4.5 Farm uses medicated feed	10
pigments, antioxidants used in feed	correctly, when necessary	
AB . 6 . 2 . 5 Feed consumed before	2.2 Farm maintain water quality,	10
shelf life expires	stocking density not exceed capacity,	
	use good-quality feed and effective	
	feeding management	
	4.1 Farm use good-quality feed, freshly	10
	produced, and not expire	
AB . 6 . 2 . 6 Regular testing on feed	4.1 Farm use good-quality feed, freshly	3
contaminants	produced, and not expire	



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AB . 6 . 3 . 1 Feed stored and	4.2 Farm store feed properly	10
produced in accordance with good		
practice		
AB . 7 . 2 . 1 Measures to optimize	2.6 Farm position aerator correctly and	10
energy use and minimize waste	operate efficiently	
AB . 7 . 3 . 1 All human solid wastes	7.10 Farm has sanitary systems for	10
from toilets collected and disposed	workers	
without contamination	7.11 Farm dispose wastes and sewage	10
	correctly	
AB . 7 . 4 . 2 Organic wastes stored	7.3 Farm should use fertiliser only	3
to reduce the risk of contamination	when necessary	
of the environment	,	
AB . 7 . 5 . 1 Predator control to	2.8 Farm with water filtering system	10
present unnecessary wildlife	installed to prevent the entering of	10
destruction	shrimp predators to farm	
destruction	2.9 Farm have predator control not	40
	harmful to importance species for	10
	ecological values	
AB . 8 . 1 . 1 Water abstraction and	7.5 Farm should comply with	10
	. ,	10
discharge meet the requirements	effluent/sludge discharge standard	40
	7.7 Farm should design wastewater	10
	canals not to cause impacts to natural	
	receiving canals	
	7.8 Farm not discharge water to fresh	10
	water and agriculture area	
AB . 8 . 1 . 3 Water quality	2.2 Farm maintain water quality,	10
monitored of discharged water	stocking density not exceed capacity,	
and/or recipient water body	use good-quality feed and effective	
	feeding management	
AB . 8 . 1 . 5 Sludge disposed of in	2.7 Farm maintain pone bottom, sludge	10
an appropriate manner	removal is done properly	
	7.6 Farm should drain waster out of	10
	culturing pond with care, to present	
	sedimentation disturb	10
	7.9 Farm dispose sludge in a	
	responsible manner	
AB . 8 . 1 . 8 Minimize use of water	2.3 Farm should decrease water	10
	exchange rate	
	7.2 Farm should decrease draining of	5
	water (wastewater)	
AB . 10 . 1 Sampling programme	8.2 Farm check chemical residues	10
based on likely contaminant	before harvesting	
SHRIMP SPECIES MODULE		
SP . 1 . 1 . 1 No wild sourced brood	3.2 Hatchery should be used brood	5
stock	stock from farm culture	
	3.3 Brood stock from capture not effect	5
	and the state of t	,



	to environmental and natural resource	
	3.1 Checking brood stock health before	10
	breeding	
- I	5.2 Hatchery nurse shrimp larvae to be	5
	in a good health and no pathogen	
health & disease free	5.4 Hatchery has measures to prevent	5
	disease outbreak from culture	
	management	
	5.5 Hatchery have measure to prevent	5
	diseases spread with in Hatchery	
SP . 4 . 1 . 1 Temperature of the	8.1 Farms should have harvesting plan	10
shrimp at harvesting reduced as	and quick sell for best freshness	
quickly	8.5 Shrimp farms should sell shrimp	10
	directly to processors for best	
1	freshness	
SP . 4 . 1 . 2 Shrimps protected to	8.2 Farm check chemical residues	3
prevent heat, losses and cross	before harvesting	
contamination		
SP . 4 . 1 . 3 Shrimps placed in clean	8.3 Farm ensure no use of prohibited	10
and disinfected bins and ice added	chemicals	
	8.6 Shrimp farms should encourage	10
	freshness control and clean ice	
SP . 4 . 2 . 1 Traceability of the	11.Traceability	10
harvested pond maintained up to		
the process line		
SP . 5 . 1 New pond not been	1.2 Farm located outside the mangrove	10
established within a designated	and consider carrying capacity of land	
national Protected Area		
SOCIAL CRITERIA		
SC 1 . 2 . 1 Responsibility for	9.7 Farm should provide worker	10
workers' health, safety and good	welfare and living condition	
social practice		
SC 1 . 2 . 14 Farm pay a living wage	9.6 Farm pays wage according to labour	10
according to UNDP statistics	laws	
SC 2 . 1 Owner has a legal land title	1.1 Farms with land title or at least 2	10
	years of renting from land	
-	owner/government	
	1.7 Farm registered with the	10



(3) GLOBALG.A.P. & ACC

ACC explicitly defines criteria that are applied for farm, hatchery, feed mill and processing plant. The benchmarking scores of GLOBALG.A.P & ACC (Details of equivalent criteria re given in Table 4-4) are:

•	All farm-base module	86.67 %
•	All aquaculture-base module	25.17 %
•	Shrimp-species module	18.18 %
•	Social module	33.33 %
•	Average	36.18%

All farm-base module

Out of 45 criteria, only 39 criteria of ACC are matching with GLOBALG.A.P. – 34 criteria are fully equivalent, 2 criteria are highly equivalent and 3 criteria are moderately equivalent. Several issues addressed in GLOBALG.A.P but not in ACC, particularly to the farm management systems related to risk assessment, internal self-assessment, environmental and biodiversity plan.

All aquaculture-base module

Out of 147 criteria, only 37 criteria of ACC are matching with GLOBALG.A.P. – 33 criteria are fully equivalent and 4 criteria are highly equivalent. Chemical, water, wastewater and waste management/disposal are the key areas that are highly equivalent.

Some specific issues to those equivalent criteria are also addressed in ACC, but not GLOBALG.A.P., which are:

- 3. Feed mills Feed mill shall reduce dependence on wild fisheries and obtain fish meal and oils from sustainable sources
- 7. Processing plant Random samples of finished products shall be analyzed for bacterial contamination and antibiotic residues by both processing plant and third-party laboratories

Shrimp-species module

Out of 33 criteria, only 6 criteria of ACC are matching with GLOBALG.A.P. – 4 criteria are fully equivalent, 1 criterion is highly equivalent and 1 criterion is moderately equivalent. Several issues addressed in GLOBALG.A.P but not in ACC, particularly to the nauplii and post larvae source, hatchery water supply, hygiene and pest control, and feed at hatchery.

Social criteria

Out of 21 criteria, only 7 criteria of ACC are matching with GLOBALG.A.P. - 7 criteria are fully equivalent. The main non-equivalent criteria are related to the workers' right such



as working time, freedom to join labor organization, communication with managers, and equity principle of employment conditions.

<u>Table 4-4</u> Benchmarking results of GLOBALG.A.P. & ACC

BAP STANDARD FOR AQUACULTURE FARM

GLOBALG.A.P.	ACC	Benchmarking score
ALL FARM –BASE MODULE	BAP STANDARD FOR FARM	
AF . 1 . 1 All records requested kept for a minimum period of time of two years	1. Farm has property right (land, water, construction, operation) and regulatory compliance	10
AF . 2 . 1 . 1 A recording system established for each unit of production	1. Farm has property right (land, water, construction, operation) and regulatory compliance	10
AF . 3 . 1 . 1 Farm have a written risk assessment for safe and healthy	3. Farm shall comply with local and national labour laws (worker safety, compensation, living conditions)	5
AF . 3 . 1 . 2 Farm have a written health, safety and hygiene policy and procedures including issues	3. Farm shall comply with local and national labour laws (worker safety, compensation, living conditions)	10
AF . 3 . 2 . 3 All workers received adequate health and safety training	9. Farms shall store fuel, lubricants and chemicals and dispose in a responsible manner	10
AF . 3 . 2 . 6 All persons working on the farm received basic hygiene training	3. Farm shall comply with local and national labour laws (worker safety, compensation, living conditions)	10
AF . 3 . 3 . 2 potential hazards clearly identified by warning signs	9. Farms shall store fuel, lubricants and chemicals and dispose in a responsible manner	10
AF . 3 . 5 . 4 Workers have access to clean food storage areas	3. Farm shall comply with local and national labour laws (worker safety, compensation, living conditions)	10
AF . 4 . 2 . 1 A documented farm waste management plan to avoid or reduce wastage and pollution	11. Farms shall treat human waste and untreated animal manure in septic tanks and not contaminate areas	10
AF . 5 . 1 . 1 Producer have a management of wildlife and conservation plan	8. Farms shall not use wild post-larvae and comply with regulations on imported seed stock	3
AF . 5 . 1 . 2 Producer considered	2. Farms shall not deny local	10



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how to enhance the environment	communities access to public	
for the benefit of the local	mangrove areas, fishing grounds or	
community	other pubic resources	2
AF . 5 . 1 . 4 The plan include a	4. Farms shall not be located in	3
baseline audit to understand	mangrove, not operated to cause	
existing animal and plant diversity	damage to wetland or biodiversity	
AF . 5 . 1 . 5 the plan include action	4. Farms shall not be located in	10
to avoid damage and deterioration	mangrove, not operated to cause	
of habitats	damage to wetland or biodiversity	
AF . 7 . 1 All producers have a	13. Farm - Product traceable to pond	10
documented recall procedure to	and inputs of origin (Trace Register	
manage the withdrawal of	online system)	
registered products		
AQUACULTURE BASE		
AB . 2 . 1 . 1 Chemicals stored in	9. Farms shall store fuel, lubricants and	10
accordance with the label	chemicals and dispose in a responsible	
instructions and legislation	manner	
AB.2.1.5 Chemicals stored in	9. Farms shall store fuel, lubricants and	10
their original packaging	chemicals and dispose in a responsible	
	manner	
AB . 5 . 1 . 1 Registered products	13. Farm - Product traceable to pond	10
traceable back to registered farms	and inputs of origin (Trace Register	
42.5.0.001	online system)	10
AB . 5 . 3 . 3 Not use natural,	10. Farms shall not use banned	10
synthetic hormones or antibiotic agents	antibiotics, drugs and other chemicals	
AB . 6 . 2 . 1 Batches of fish feed	13. Farm - Product traceable to pond	10
traceable from the feed	and inputs of origin (Trace Register	
manufacturer	online system)	
AB . 6 . 2 . 2 Documentary record of	13. Farm - Product traceable to pond	10
feed suppliers	and inputs of origin (Trace Register	
	online system)	
AB . 7 . 1 . 7 Competent authorities	6. Farms shall contain sediment from	5
and local communities been	ponds and not cause salinization or	
informed when salinization	ecological nuisance in surrounding land	
	and water	
	7. Farm construction and operations	
	shall not cause soil and water	5
	salinization or groundwater depletion	
AB . 7 . 3 . 1 All human solid wastes	11. Farms shall treat human waste and	10
from toilets collected and disposed	untreated animal manure in septic	
without contamination	tanks and not contaminate areas	
AB.8.1.3 Water quality	5. Farm shall monitor effluent	10
monitored of discharged water		
and/or recipient water body		



AB . 8 . 1 . 5 Sludge disposed of in an appropriate manner SHRIMP SPECIES MODULE	6. Farms shall contain sediment from ponds and not cause salinization or ecological nuisance in surrounding land and water	10
SP . 1 . 1 . 3 Brood stock purchased	8. Farms shall not use wild post-larvae	10
from certified suppliers	and comply with regulations on imported seed stock	10
SP . 4 . 1 . 1 Temperature of the shrimp at harvesting reduced as quickly	12. Farms shall harvest and transport with temperature control and minimise physical damage and contamination	10
SP . 5 . 1 New pond not been established within a designated national protected area	2. Farms shall not deny local communities access to public mangrove areas, fishing grounds or other public resources	3
CD C COCIAL CRITERIA	4. Farms shall not be located in mangrove, not operated to cause damage to wetland or biodiversity	10
SP 6. SOCIAL CRITERIA SC 1 . 2 . 1 Responsibility for	3. Farm shall comply with local and	10
workers' health, safety and good social practice	national labour laws (worker safety, compensation, living conditions)	10
SC 2 . 1 Owner has a legal land title to the land where aquaculture takes place	1. Farm - Property right (land, water, construction, operation) and regulatory compliance	10

BAP STANDARD FOR HATCHERY

GLOBALG.A.P.	ACC	Benchmarking
		score
ALL FARM-BASE MODULE	BAP STANDARD FOR HATCHERY	
AF . 1 . 1 All records requested kept for a minimum period of time of two years	1. Hatchery has property right (land, water, construction, operation) and regulatory compliance	10
AF . 2 . 1 . 1 A recording system established for each unit of production	Hatchery has property right (land, water, construction, operation) and regulatory compliance	10
AF . 3 . 1 . 1 Farm have a written risk assessment for safe and healthy	3. Hatchery shall comply with local and national labour laws (worker safety, compensation, living conditions)	5



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45.04.05		10
AF . 3 . 1 . 2 Farm have a written	3. Hatchery shall comply with local and	10
health, safety and hygiene policy	national labour laws (worker safety,	
and procedures including issues	compensation, living conditions)	
AF . 3 . 2 . 3 All workers received	3. Hatchery shall comply with local and	10
adequate health and safety training	national labour laws (worker safety,	
	compensation, living conditions)	
AF . 3 . 2 . 6 All persons working on	3. Hatchery shall comply with local and	10
the farm received basic hygiene	national labour laws (worker safety,	
training	compensation, living conditions)	
AF . 3 . 3 . 2 potential hazards	7. Hatchery shall store fuel, lubricants	10
clearly identified by warning signs	and chemicals and dispose in a	
	responsible manner	
AF . 3 . 5 . 4 Workers have access to	3. Hatchery shall comply with local and	10
clean food storage areas	national labour laws (worker safety,	
	compensation, living conditions)	
AF . 5 . 1 . 2 Producer considered	2. Hatchery shall not deny local	10
how to enhance the environment	communities access to public	
for the benefit of the local	mangrove areas, fishing grounds or	
community	other public resources	
AF . 5 . 1 . 4 The plan include a	4. Hatchery shall not be located in	3
baseline audit to understand	mangrove, not operated to cause	
existing animal and plant diversity	damage to wetland or biodiversity	
AF . 5 . 1 . 5 the plan include action	4. Hatchery shall not be located in	10
to avoid damage and deterioration	mangrove, not operated to cause	
of habitats	damage to wetland or biodiversity	
AF . 7 . 1 All producers have a	10. Hatchery -Product traceability	
documented recall procedure to	,	
manage the withdrawal of		
registered products		
AQUACULTURE-BASE MODULE		
AB . 2 . 1 . 5 Chemicals stored in	7. Hatchery shall store fuel, lubricants	10
their original packaging	and chemicals and dispose in a	
	responsible manner	
AB . 5 . 1 . 2 Fish traceable to the	10. Hatchery -Product traceability	10
farm of hatching	,	
AB . 5 . 3 . 3 Not use natural,	9. Hatchery shall not use banned	10
synthetic hormones or antibiotic	antibiotics, drugs and other chemical	
agents	compounds (no prophylactic purpose)	
AB . 7 . 3 . 1 All human solid wastes	8. Hatchery shall not release untreated	10
from toilets collected and disposed	human sewage into local ecosystem	
without contamination	without proper treatment	
AB . 8 . 1 . 3 Water quality	6. Hatchery shall monitor effluent	10
monitored of discharged water	and the state of t	
monitored of discharged water		



and/or recipient water body SHRIMP- SPECIES MODULE SP. 1. 1. 2 Selected stocks of disease free SP. 1. 1. 4 Brood stock held monitoring and control procedure to minimise risk of disease SP. 1. 1. 4 Brood stock held quarantine until their disease status is verified and for a minimum of 20 days SP. 1. 1. 5 Brood stock screened for general health, is screened for general health, is screened for established within a designated national protected area SOCIAL CRITERIA SC 1. 2. 1 Responsibility for workers' health, safety and good social practice SC 2. 1 Owner has a legal land title to the land where aquaculture takes place S. Hatchery shall establish health monitoring and control procedure to minimise risk of disease 5. Hatchery shall establish health monitoring and control procedure to minimise risk of disease 4. Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity 3. Hatchery shall comply with local and national labour laws (worker safety, compensation, living conditions) 10 mangrove, not operated to cause damage to wetland or biodiversity 11 Hatchery has property right (land, water, construction, operation) and regulatory compliance			
SP . 1 . 1 . 2 Selected stocks of disease free SP . 1 . 1 . 2 Selected stocks of monitoring and control procedure to minimise risk of disease SP . 1 . 1 . 4 Brood stock held quarantine until their disease status is verified and for a minimum of 20 days SP . 1 . 1 . 5 Brood stock screened for general health, is screened for known virus SP . 5 . 1 New pond not been established within a designated national protected area SC 1 . 2 . 1 Responsibility for workers' health, safety and good social practice SC 2 . 1 Owner has a legal land title to the land where aquaculture SC 2 . 1 Owner has a legal land title to the land where aquaculture SC 3 . Hatchery shall establish health monitoring and control procedure to minimise risk of disease SC 3 . Hatchery shall establish health monitoring and control procedure to minimise risk of disease 4 . Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity SOCIAL CRITERIA SC 1 . 2 . 1 Responsibility for workers' health, safety and good social practice SC 2 . 1 Owner has a legal land title to the land where aquaculture SC 2 . 1 Owner has a legal land title water, construction, operation) and	and/or recipient water body		
disease free monitoring and control procedure to minimise risk of disease SP.1.1.4 Brood stock held quarantine until their disease status is verified and for a minimise risk of disease SP.1.1.5 Brood stock screened for general health, is screened for known virus SP.5.1 New pond not been established within a designated national protected area SOCIAL CRITERIA SC1.2.1 Responsibility for workers' health, safety and good social practice monitoring and control procedure to minimise risk of disease 4. Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity 10 SC2.1 Owner has a legal land title to the land where aquaculture monitoring and control procedure to minimise risk of disease 5. Hatchery shall establish health monitoring and control procedure to minimise risk of disease 4. Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity 10 SC2.1 Owner has a legal land title to the land where aquaculture 11 12 13 14 15 15 16 17 17 18 18 18 18 18 19 19 10 10 10 10 10 10 10 10	SHRIMP- SPECIES MODULE		
SP.1.1.4 Brood stock held quarantine until their disease status is verified and for a minimum of 20 days SP.1.1.5 Brood stock screened for general health, is screened for known virus SP.5.1 New pond not been established within a designated national protected area SC1.2.1 Responsibility for workers' health, safety and good social practice minimise risk of disease 5. Hatchery shall establish health monitoring and control procedure to minimise risk of disease 4. Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity SOCIAL CRITERIA SC1.2.1 Responsibility for workers' health, safety and good social practice 1. Hatchery has property right (land, water, construction, operation) and	SP . 1 . 1 . 2 Selected stocks of	5. Hatchery shall establish health	10
SP.1.1.4 Brood stock held quarantine until their disease status is verified and for a minimum of 20 days SP.1.1.5 Brood stock screened for general health, is screened for known virus SP.5.1 New pond not been established within a designated national protected area SC1.2.1 Responsibility for workers' health, safety and good social practice S. Hatchery shall establish health monitoring and control procedure to minimise risk of disease 4. Hatchery shall not be located in mangrove, not operated to cause damage to wetland or biodiversity SOCIAL CRITERIA SC1.2.1 Responsibility for workers' health, safety and good social practice 1. Hatchery has property right (land, water, construction, operation) and	disease free	monitoring and control procedure to	
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social practice compensation, living conditions) SC 2 . 1 Owner has a legal land title to the land where aquaculture construction, operation) and	SC 1 . 2 . 1 Responsibility for	3. Hatchery shall comply with local and	10
SC 2 . 1 Owner has a legal land title to the land where aquaculture 1. Hatchery has property right (land, water, construction, operation) and	workers' health, safety and good	national labour laws (worker safety,	
to the land where aquaculture water, construction, operation) and	social practice	compensation, living conditions)	
to the land where aquaculture water, construction, operation) and			
	SC 2 . 1 Owner has a legal land title	1. Hatchery has property right (land,	10
takes place regulatory compliance	to the land where aquaculture	water, construction, operation) and	
	takes place	regulatory compliance	

BAP STANDARD FOR FEED MILL

GLOBALG.A.P.	ACC	Benchmarking
		score
ALL FARM-BASE MODULE	BAP STANDARD FOR FEED MILL	
AF . 1 . 1 All records requested kept	1. Feed mill shall comply with	10
for a minimum period of time of	local/national laws and environmental	
two years	regulations	
AF . 2 . 1 . 1 A recording system	1. Feed mill shall comply with	10
established for each unit of	local/national laws and environmental	
production	regulations	
AF . 3 . 2 . 3 All workers received	2. Feed mill shall comply with local and	10
adequate health and safety training	national labour laws (worker safety,	
	compensation, living conditions)	
AF . 3 . 2 . 6 All persons working on	2. Feed mill shall comply with local and	10
the farm received basic hygiene	national labour laws (worker safety,	
training	compensation, living conditions)	
AF . 3 . 3 . 2 potential hazards	4. Feed mill shall label, store, use and	10



clearly identified by warning signs	dispose fuel, lubricants and chemicals	
	and dispose in a responsible manner	
AF . 7 . 1 All producers have a	7. Feed mill - Product traceable to pond	10
documented recall procedure to	and inputs of origin (Trace Register	
manage the withdrawal of	online system)	
registered products		
AQUACULTURE-BASE MODULE		
AB . 2 . 1 . 5 Chemicals stored in	4. Feed mill shall label, store, use and	10
their original packaging	dispose fuel, lubricants and chemicals	
	and dispose in a responsible manner	
AB . 2 . 2 . 3 Use official collection	5. Feed mill shall dispose refuses in a	10
and disposal systems	responsible and bio secure manner	
AB . 2 . 2 . 4 Empty containers kept	5. Feed mill shall dispose refuses in a	10
secure until disposal	responsible and bio secure manner	
AB . 2 . 2 . 5 Local regulations	5. Feed mill shall dispose refuses in a	10
regarding disposal of containers	responsible and bio secure manner	
and packaging		
AB . 2 . 2 . 6 Waste disposal by	5. Feed mill shall dispose refuses in a	10
certified waste contractor	responsible and bio secure manner	
AB . 6 . 2 . 1 Batches of fish feed	7. Feed mill - Product traceable to pond	10
traceable from the feed	and inputs of origin (Trace Register	
manufacturer	online system)	
AB . 6 . 2 . 2 Documentary record of	7. Feed mill - Product traceable to pond	10
feed suppliers	and inputs of origin (Trace Register	
	online system)	
AB . 6 . 2 . 3 Declaration of feed	6. Feed mills shall have current,	10
constituents from feed suppliers	systematic, documented process	
	controls with good manufacturing	
	practice to minimise food safety	
	hazards	
	7. Feed mill - Product traceable to pond	
	and inputs of origin (Trace Register	
	online system)	
AB . 6 . 2 . 4 List of all antibiotics,	6. Feed mills shall have current,	10
pigments, antioxidants used in feed	systematic, documented process	
	controls with good manufacturing	
	practice to minimise food safety	
	hazards	
	7. Feed mill - Product traceable to pond	
	and inputs of origin (Trace Register	
	online system)	
AB . 6 . 2 . 6 Regular testing on feed	6. Feed mills shall have current,	10
contaminants	systematic, documented process	
	controls with good manufacturing	
	practice to minimise food safety	
	hazards	



AB . 6 . 3 . 2 Separate bin for excess medicated feed	3. Feed mills shall reduce dependence on wild fisheries and obtain fish meals and oils from sustainable sources	10
SOCIAL CRITERIA		
SC 1 . 2 . 1 Responsibility for workers' health, safety and good social practice	 Feed mill shall comply with local/national laws and environmental regulations Feed mill shall comply with local and national labour laws (worker safety, compensation, living conditions) 	10
SC 2 . 1 Owner has a legal land title to the land where aquaculture takes place	1. Feed mill shall comply with local/national laws and environmental regulations	10

BAP STD FOR PROCESSING PLANT

GLOBALG.A.P.	ACC	Benchmarking score
ALL FARM-BASE MODULE	BAP STD FOR PROCESSING PLANT	
AF . 1 . 1 All records requested kept for a minimum period of time of two years	1. Processing plant shall comply with local/national laws and environmental regulations	10
AF . 2 . 1 . 1 A recording system established for each unit of production	1. Processing plant shall comply with local/national laws and environmental regulations	10
AF . 3 . 2 . 3 All workers received adequate health and safety training	2. Processing plant shall comply with local and national labour laws (worker safety, compensation, living conditions)	10
AF . 3 . 2 . 6 All persons working on the farm received basic hygiene training	2. Processing plant shall comply with local and national labour laws (worker safety, compensation, living conditions)	10
AF . 3 . 3 . 2 potential hazards clearly identified by warning signs	4. Processing plant shall label, store, use and dispose fuel, lubricants and chemicals and dispose in a responsible manner	10
AF . 7 . 1 All producers have a documented recall procedure to manage the withdrawal of registered products AQUACULTURE-BASE MODULE	8. Processing plant - Product traceable	10
AB . 2 . 1 . 1 Chemicals stored in accordance with the label instructions and legislation	4. Processing plant shall label, store, use and dispose fuel, lubricants and chemicals and dispose in a responsible	10



	<u> </u>	1
	manner	
AB . 2 . 1 . 5 Chemicals stored in	4. Processing plant shall label, store,	10
their original packaging	use and dispose fuel, lubricants and	
	chemicals and dispose in a responsible	
	manner	
AB . 2 . 2 . 6 Waste disposal by	5. Processing plant shall dispose	10
certified waste contractor	refuses in a responsible and bio secure	
	manner	
AB . 8 . 1 . 3 Water quality	3.Processing plant dispose of process	10
monitored of discharged water	water and sewage in a responsible	
and/or recipient water body	manner	
SHRIMP-SPECIES MODULE		
SP . 4 . 2 . 1 Traceability of the	8. Processing plant - Product traceable	10
harvested pond maintained up to		
the process line		
SP 6. SOCIAL CRITERIA		
SC 1 . 2 . 1 Responsibility for	1. Processing plant shall comply with	10
workers' health, safety and good	local and national labour laws (worker	
social practice	safety, compensation, living conditions)	
	2. Processing plant shall comply with	10
	local and national labour laws (worker	
	safety, compensation, living conditions)	
	6. Processing plant shall have HACCP	10
	plan process control to control food	10
	hazards and ensure product safety	
SC 2 . 1 Owner has a legal land title	1. Processing plant shall comply with	10
to the land where aquaculture	local/national laws and environmental	
takes place	regulations	

(5) GLOBALG.A.P. & Organic - Naturland

The benchmarking scores of GLOBALG.A.P & Naturland (Details of equivalent criteria re given in Table 4-5) are:

•	All farm-base module	80.00 %
•	All aquaculture-base module	25.85 %
•	Shrimp-species module	27.27 %
•	Social module	80.95 %
•	Average	40.65 %



All farm-base module

Out of 45 criteria, 36 criteria of Organic-Naturland are matching with GLOBALG.A.P. -25 criteria are fully equivalent, 7 criteria are highly equivalent and 4 criteria are moderately equivalent. Both certification schemes specify the training for workers, which are rather different from other certifications mentioned before. Several issues addressed in GLOBALG.A.P but not in Naturland, particularly to record keeping, internal assessment, waste and pollution action plan.

All aquaculture-base module

Out of 147 criteria, only 38 criteria of Organic-Naturland are matching with GLOBALG.A.P. — 19 criteria are fully equivalent, 6 criteria are highly equivalent and 13 criteria are moderately equivalent. Site management, fish health and welfare, medicine, feed, environmental management, energy efficiency, waste, predator control, waster usage and disposal are the key areas that are highly equivalent. Some specific issues to those equivalent criteria are also addressed in Naturland, but not GLOBALG.A.P., which are:

Principle management

6.1 The basis for aquaculture operation shall form the natural, physical conditions of water body (aeration not used to raise density above limit)

Supplementary regulation for pond culture of shrimp

- 6.3 No treatment with antibiotics, chemotherapeutic
- 8.1 Reduce external feed by increasing natural feed production in ponds
- 8.2 Feed intake shall be monitored and documented

Several issues addressed in GLOBALG.A.P but not in Organic-Naturland, particularly to the Chemical, pest control and occupational health and safety

Shrimp-species module

Out of 33 criteria, only 9 criteria of Organic-Naturland are matching with GLOBALG.A.P. – 4 criteria are fully equivalent, 2 criteria are highly equivalent and 3 criterion are moderately equivalent. Some specific issues to those equivalent criteria are also addressed in Organic-Naturland, but not in GLOBALG.A.P., which are:

Principle management

- 2.1. As stock, species naturally occurring in the region shall be preferred
- 2.2. Where suitable, polyculture shall be preferred
- 2.3. Organic stock
- 3.2 Hatchery -The use of hormones, even from the same species, is not allowed.
- 4.1. The husbandry conditions must enable the animal to behave in a way natural to the species



- 4.2. For construction and management are not causing any injurious effects on the organisms or the environment
 - 10.1 Customary smoking techniques are permitted, but not black smoke

Supplementary regulation for pond culture of shrimp

- 4.1 Hatchery No use of prohibited antibiotics, chemotherapeutics
- 4.2 Hatchery Alimentation of parent stock and larvae and culture of feed (e.g. Artemia, algae) in hatcheries according to principle or organic aquaculture
 - 4.3 Hatchery No physical manipulation of animals to obtain eggs
- 4.4 Hatchery Decrease aeration, artificial light and heat in culture of brood stock and larvae as much as possible
 - 9.2 No use of metabisulfite during harvest procedure

However, several issues addressed in GLOBALG.A.P but not in Naturland, particularly to the Frequency of mortality inspection, hygiene and pest control, feed at hatchery.

Social module

Out of 21 criteria, 17 criteria of Organic-Naturland are matching with GLOBALG.A.P. - 10 criteria are fully equivalent, 2 criteria are highly equivalent and 5 criteria are moderately equivalent. Work right and social environmental are the key areas that are highly equivalent.

<u>Table 4-5</u> Benchmarking results of GLOBALG.A.P. & Organic, Naturland

PRINCIPLE OF MANAGEMENT

GLOBALG.A.P.	NATURLAND	Benchmarking
ALL FARM-BASE MODULE	Principles of management	score
AF . 2 . 1 . 2 A reference	1.1 By selection of site and the method of	10
system for each field,	management of the farm, the surrounding	
orchard, greenhouse, yard	ecosystems shall not be adversely affected	
AF . 2 . 2 . 1 A risk	1.1 By selection of site and the method of	10
assessment for new	management of the farm, the surrounding	
agricultural sites	ecosystems shall not be adversely affected	
	1.3 Design and management of the farm	10
	areas it shall be ensured that the water	
	bodies in-side the operation retain their	
	ecological functions	10
	4.2 For construction and management are	
	not causing any injurious effects on the	
	organisms or the environment	
AF . 2 . 2 . 2 Management	1.3 Design and management of the farm	10
plan been developed setting	areas it shall be ensured that the water	
out strategies to minimise all	bodies in-side the operation retain their	



	<u>, </u>	
identified risks	ecological functions 4.2. For construction and management are not causing any injurious effects on the organisms or the environment	10
AF . 4 . 1 . 1 All possible waste products and sources of pollution been identified in all areas of the business	1.6. The farm produces a sustainability plan	10
AF . 5 . 1 . 1 Producer have a management of wildlife and conservation plan	1.4. While protecting the farm areas from predatory not harming the animals physically shall be preferred (e.g. nets,	10
	dummy raptors) 1.3 Design and management of the farm areas it shall be ensured that the water bodies in-side the operation retain their ecological functions	5
AF . 5 . 1 . 2 Producer considered how to enhance the environment for the benefit of the local community	1.2. The farmer shall reach an agreement with the representatives of neighbouring local and regional authorities to ensure free access to the natural water courses surrounding the farm	10
AF . 5 . 1 . 3 Policy compatible with sustainable commercial agricultural production	1.6. The farm produces a sustainability plan	10
AF . 5 . 1 . 5 the plan include action to avoid damage and deterioration of habitats	1.1 By selection of site and the method of management of the farm, the surrounding ecosystems shall not be adversely affected	10
	4.2. For construction and management are not causing any injurious effects on the organisms or the environment	10
AF . 5 . 1 . 6 The plan include activities to enhance habitats and increase biodiversity	1.3 Design and management of the farm areas it shall be ensured that the water bodies in-side the operation retain their	5
	ecological functions 1.4. While protecting the farm areas from predatory not harming the animals physically shall be preferred (e.g. nets, dummy raptors)	10
AF . 5 . 2 . 1 The conversion of unproductive sites to conservation areas for the	1.3 Design and management of the farm areas it shall be ensured that the water bodies in-side the operation retain their	10



	T	Γ
encouragement of natural	ecological functions	
flora and fauna		
AF . 5 . 3 . 1 The producer	1.5. Preference is to be given to the use of	3
show monitoring of energy	renewable energy resources and recycle	
use on the farm	materials	
AQUACULTURE -BASE		Benchmarking
MODULE		score
AB . 1 . 2 . 5 Water supply	1.3 Design and management of the farm	3
and effluent are not mixed	areas it shall be ensured that the water	
	bodies in-side the operation retain their	
	ecological functions	
AB . 1 . 2 . 9 Design and	1.1 By selection of site and the method of	10
construction of site support	management of the farm, the surrounding	
the biodiversity plan	ecosystems shall not be adversely affected	
AB . 5 . 3 . 1 Use approved	5.2. Permitted treatments, as prophylactics	10
medicines	or routine (within the framework of	
	statutory regulations), approved by	
	Naturland	
AB . 5 . 3 . 3 Not use natural,	3.2 The use of hormones, even from the	5
synthetic hormones or	same species, is not allowed	
antibiotic agents		
AB . 5 . 3 . 5 Medicines	5.1 Use of conventional medicine is only	3
disposed in a manner agreed	permitted in vertebrates and after detailed	
by veterinarians	diagnosis and remedial prescription by a	
	veterinarian	
AB . 6 . 1 . 1 Suitable diet for	7.1 Organic fertiliser can be used to	5
the species farmed	cultivate water bodies	
	7.2 Organic fertilising allowed only if	
	combined with other forms of animal	3
	husbandry or crop plantations	_
	8.1. For certain culture systems an upper	
	limit for the application quantity feed/area	3
	can be determined	3
	8.2. Type, quantity and composition of feed	
	must take into account the natural feeding	10
	methods of the concerned animal species	10
AB . 6 . 1 . 2 Compound feed	8.3. All the feed stuffs must be produced in	5
obtained from an	accordance with Naturland standards	
appropriate source	8.4. Feed from genetically altered	3
	organisms or their products is not	
	permitted	3
	8.5 Feed ingredients for the culture of	
	carnivorous species with higher protein	3
	requirements	
	8.6.Feeding of natural pigments (e.g. in the	10
	form of shrimp shells or Phaffia yeast) is	



	permitted	
	8.7. Synthetic antibiotic and growth-	
	enhancing substances as well as other	
	synthetic feed additives are not permitted	
AB . 7 . 1 . 1 Environmental	1.6. The farm produces a sustainability plan	10
and biodiversity policy		
AB . 7 . 5 . 1 Predator control	1.4. While protecting the farm areas from	10
to present unnecessary	predatory not harming the animals	
wildlife destruction	physically shall be preferred (e.g. nets,	
	dummy raptors)	
SHRIMP-SPECIES MODULE		
SP . 1 . 3 . 1 Incoming water	3.1 Hatchery - The respective provisions for	10
disinfected to destroy	grow-out operations apply correspondingly	
pathogens		
SP . 4 . 1 . 1 Temperature of	9.1. Transport and slaughtering must be	5
the shrimp at harvesting	done as quickly and humanely as possible in	
reduced as quickly	order to spare the animals unnecessary	
	suffering	
SP . 4 . 1 . 2 Shrimps	9.2. Maintenance of the cold chain from the	5
protected to prevent heat,	point of slaughtering up to the sales point	
losses and cross	must be strictly observed	
contamination		
SP . 4 . 1 . 3 Shrimps placed	9.3. The cleaning of factory rooms, devices	3
in clean and disinfected bins	and machines must ensure a perfect	
and ice added	hygiene along with an as high as possible	
	eco-friendliness	
SOCIAL CRITERIA		Benchmarking
		score
SC 2 . 1 Owner has a legal	1.1 Not permit to remove mangrove for	3
land title to the land where	pond construction	
aquaculture takes place	1.2 Former farms located in mangrove not	3
	more than 50% of the area can convert	
	to organic shrimp farm	
	1.3 Former mangrove area must be rein	3
	stored to at least 50% during 5 years	
SC 2 . 2 Participatory social	1.2. The farmer shall reach an agreement	10
impact assessment and	with the representatives of neighbouring	
sufficient compensation	local and regional authorities to ensure free	
	access to the natural water courses	
	surrounding the farm	



Supplementary regulation for pond culture of shrimp

GLOBALG.A.P.	NATURLAND	Benchmarking
ALL FARM BASE	Supplementary regulation for pond culture of shrimp	score
AF . 5 . 1 . 1 Producer have a management of wildlife and conservation plan	2.5 Documentation on foraging predators, estimated harvest loss and type of preventive measures shall be kept	10
	2.6 Unwanted fish regulated by mechanical means or application of natural/herbal ichthyoids (e.g. saponine)	5
AF . 5 . 1 . 5 the plan include action to avoid	1.1 Not permit to remove mangrove for pond construction	10
damage and deterioration of habitats	1.2 Former farms located in mangrove not more than 50% of the area can convert to organic shrimp farm	10
	2.1 Effluent water quality monitoring	3
	2.2 Minimising outflow of nutrient and suspended solid during harvesting	3
AF . 5 . 1 . 6 The plan include activities to	1.3 Former mangrove area must be rein stored to at least 50% during 5 years	10
enhance habitats and	3.1 Native species preferred as stock	5
increase biodiversity	5.1 Adequate pond design to support natural foraging behaviours of shrimp	3
AF . 5 . 2 . 1 The conversion of unproductive sites to	2.4 At least 50% of total dyke surface shall be covered by plants	10
conservation areas for the encouragement of natural flora and fauna	5.1 Adequate pond design to support natural foraging behaviours of shrimp	5
AQUACULTURE BASE		
AB . 1 . 2 . 7 Vegetative buffer zones and habitat corridors	2.4 At least 50% of total dyke surface shall be covered by plants	10
AB . 1 . 2 . 9 Design and construction of site support the biodiversity plan	5.1 Adequate pond design to support natural foraging behaviours of shrimp	10
AB . 1 . 2 . 12 Written procedure for pond routine dry out	6.4 Pond bottom shall be given enough time to dry	10
AB . 2 . 1 . 7 Chemical store able to retain spillage	2.7 Release of toxic or otherwise harmful substance in the pond	3
AB . 5 . 2 . 1 History and current overview of fish health status	6.2 Health status of animals shall be monitored and documented on a regular basis	10



AB . 5 . 2 . 2 Producers	6.1 Prevent stress (e.g. control origin of	3
demonstrate understanding of hygiene practices	larvae, monitor water quality)	
AB . 5 . 2 . 10 Stocking density not exceed the maximum load	5.3 As provisional maximum for stocking density shall be set 15 post larvae/m2	5
AB . 5 . 2 . 11 Water quality monitoring program	6.1 Prevent stress (e.g. control origin of larvae, monitor water quality)	10
AB . 5 . 2 . 12 Fish treated and handled to protect them from pain, stress, injury and disease	6.1 Particular stress shall be laid on preventive measures	10
AB . 5 . 8 . 1 Fish fasted before slaughter	9.1 At least 3 days, feeding and fertilising shall be stopped for adequate period before harvesting	10
AB . 6 . 1 . 2 Compound feed obtained from an appropriate source	9.3 Reuse of shrimp heads and other processing residues/trimming (feeding to same species not allowed)	3
AB.7.1.7 Competent authorities and local communities been informed when salinization	2.3 No salinization/scattered salt dust to adjacent agricultural activities	3
AB . 7 . 2 . 1 Measures to optimize energy use and minimize waste	5.2 Lowest possible water exchange rate to decrease energy consumption and nutrient loss	5
AB.7.4.1 N, P levels limits in accordance with national and international legislation	2.2 Minimising outflow of nutrient and suspended solid during harvesting	10
AB . 7 . 4 . 2 Organic wastes stored to reduce the risk of contamination of the environment	2.2 Minimising outflow of nutrient and suspended solid during harvesting7.1 Permit supplementary doses of phosphate but the over quantity is limited by effluent's quality	10
AB . 7 . 5 . 1 Predator control to present unnecessary wildlife	2.5 Documentation on foraging predators, estimated harvest loss and type of preventive measures shall be kept	5
destruction	2.6 Unwanted fish regulated by mechanical means or application of natural/herbal ichtyocides (e.g. saponine)	5
AB . 8 . 1 . 3 Water quality monitored of discharged water and/or recipient	2.1 Effluent water quality monitoring2.7 Prevent release of toxic or harmful substances in ponds, channels or banks	10 3
water body	case and on portion, criaining or build	



AB . 8 . 1 . 8 Minimize use of water	5.2 Lowest possible water exchange rate to decrease energy consumption and nutrient loss	10
SHRIMP SPECIES MODULE		
SP . 1 . 1 . 1 No wild sourced brood stock	3.1 Native species preferred as stock	5
SP . 1 . 1 . 3 Brood stock purchased from certified suppliers	3.2 If available, stock from certified organic origin has to be used	10
SP . 1 . 2 . 1 No wild sourced post larvae	3.2 Stock from certified organic origin has to use, collecting wild shrimp larvae is prohibited	10
SP . 5 . 1 New pond not been established within a designated national protected area	1.1 mangrove plant communities have to be protected	10
SP . 5 . 4 Management and restoration, retiring non-compliant ponds areas above the inter-tidal zone	1.2 Farm mangrove area not exceed 50% and farm shall be reforested	5

SOCIAL RESPONSIBILITY

GLOBALG.A.P.	NATURLAND	Benchmarking
ALL FARM BASE	Social responsibility	score
AF . 3 . 1 . 2 Farm have a	6. Health and safety/All workers,	10
written health, safety and	employees and their families shall have	
hygiene policy and	access to drinking water, food,	
procedures including issues	accommodation and basic medical care	
AF . 3 . 2 . 3 All workers	7.7. Further education/The unit offer its	10
received adequate health	employees the possibility of further	
and safety training	education and professional training	
AF . 3 . 2 . 4 Always an	7.7. Further education/The unit offer its	5
appropriate number of	employees the possibility of further	
persons (at least one	education and professional training	
person) trained in first aid		
present on each farm		
AF . 3 . 2 . 6 All persons	7.7. Further education/The unit offer its	5
working on the farm	employees the possibility of further	
received basic hygiene	education and professional training	
training		
AF . 3 . 3 . 3 Safety advice	6. Health and safety/All workers,	10
available/accessible for	employees and their families shall have	
substances hazardous to	access to drinking water, food,	
worker	accommodation and basic medical care	
AF . 3 . 3 . 4 First Aid kits	6. Health and safety/All workers,	10



present at all permanent sites	employees and their families shall have access to drinking water, food, accommodation and basic medical care	
AF.3.4.1 Workers (including subcontractors) equipped with suitable protective clothing in accordance with legal requirements	1. Human rights/They must com-ply at the minimum with the local legal requirements	10
AF . 3 . 5 . 4 Workers have access to clean food storage areas	1. Human rights/They must com-ply at the minimum with the local legal requirements	10
AF . 3 . 5 . 5 Living quarters habitable and have the basic services and facilities	1. Human rights/They must com-ply at the minimum with the local legal requirements	10
SOCIAL CRITERIA		
SC 1 . 2 . 1 Responsibility for workers' health, safety and good social practice	6. Health and safety/All workers, employees and their families shall have access to drinking water, food, accommodation and basic medical care.	10
	7.4. Payment in kind/lf they so choose, workers may receive part of their wage in kind for services such as housing 7.6. Social benefits/The employer ensures	10
	basic coverage for maternity, sickness and retirement 7.7. Further education/The unit offer its	10
	employees the possibility of further education and professional training	3
SC 1.2.3 Copies of working contracts	7.1. Contracts/All workers receive a written contract of employment describing the basic conditions	10
SC 1 . 2 . 6 No employ- forced labour	2. The operations commit themselves to rejecting forced labour and any type of involuntary work	5
	5. Child labour/No children may be employed on farms. Children may work on the farms of their own families or a neighbouring farm	10
SC 1 . 2 . 8 Workers have the freedom to join labour organization	3. workers have a right to freedom of association and collective bargaining, and are at liberty to exercise this right	10
SC 1 . 2 . 9 Complain form for employees and affected communities	7.5 an annual limit of working hours or a mutual agreement on overtime requirements	3



SC 1 . 2 . 14 Farm pay a living wage according to	1. Human rights/They must com-ply at the minimum with the local legal requirements	5
UNDP statistics	7.3. Wages/Workers shall be paid at least the official national minimum wage or the	10
	relevant industry standard	
SC 1 . 2 . 15 Employment	4. No discrimination on the basis of race,	10
conditions comply with	creed, sex, political opinion or membership	
equality principles	shall be tolerated	
	7.2 The different kinds of employment shall	10
	in no case result in the unequal treatment	_0
	of any workers	

(6) ACC & Thai COC

The benchmarking scores of ACC & Thai COC (Details of equivalent criteria re given in Tables 4-6 to 4-9) are:

ACC: BAP standard for farm & Thai COC farm

•	Social	100.00 %
•	Environmental	83.33 %
•	Food safety	100.00 %
•	Traceability	75.00 %
•	Average	89.58%

ACC: BAP standard for hatchery & Thai COC hatchery

•	Social	100.00 %
•	Environmental	60.00 %
•	Food safety	100.00 %
•	Traceability	75.00 %
•	Average	83.75%

Environmental criteria

At the farm level, the environmental criteria of ACC & Thai COC are fully equivalent, with additional criteria cover in Thai COC. Some specific issues to those equivalent criteria are also addressed in ACC, but not in ACC, which are:

- 2.1 Farm with good layout according to technical requirements
- 2.2 Farm maintain water quality, stocking density not exceed capacity, use good-quality feed and effective feeding management
- 2.3 Farm should decrease water exchange rate
- 2.4 Farm use fertiliser, limes and chemical in a responsible manner
- 2.5 Farm monitor and manage shrimp health



- 2.6 Farm position aerator correctly and operate efficiently
- 2.8 Farm with water filtering system installed to prevent the entering of shrimp predators to farm
- 2.9 Farm has predator control not harmful to importance species for ecological values
- 7.1 Farm should canals and embankments to reduce erosion
- 7.2 Farm should decrease draining of water (wastewater)
- 7.3 Farm should use fertiliser only when necessary
- 7.6 Farm should drain waste out of culturing pond with care, to present sedimentation disturb
- 7.10 Farm has sanitary systems for workers
- 7.12 Farm has management system accordance with legislations
- 7.13 Farm evaluates waste management system and continuously improves At the hatchery level, the environmental criteria of ACC & Thai COC are also fully equivalent 5 criteria are highly equivalent and 1 criterion is moderately equivalent.

Food safety criteria

In the food safety criteria for farm and hatchery, both schemes are fully equivalent. Some specific issues to those equivalent criteria are also addressed in Thai COC, but not ACC: BAP standard for farm, which are:

- 5.1 Farm monitor shrimp heath and water quality in ponds regularly
- 5.2 Farm has measures to prevent disease outbreak from pond management
- 5.3 Farm has measure to prevent diseases spread within farm
- 6.2 In case of using harmful chemical, draining water after chemical disintegrate
- 6.3 Farm record the chemical use
- 6.4 Farm stores chemical properly, dispose in a responsible manner
- 6.5 Farm uses veterinary drugs and chemical used accordance with the instructions by government and national standard

Social criteria

In the social criteria for farm, both schemes are fully equivalent. However, Thai COC specifies several additional social criteria, which are:

- 9.1 Farm is recommended to provide support and assist o the local community
- 9.2 Farm participates mangrove plantation program, good relation/no impacts on local community
- 9.3 S Farm supports local community in environmental conservation, public health, safety and education
 - 9.4 Farm/association inform workers their roles and organization structure
 - 9.5 Farms should use local labours
 - 9.8 Farm should have farm management policy
 - 10.1 Farms have regular group discussion



- 10.2 Farmer should participate to seminar and/or training on related shrimp culture techniques
 - 10.3 Farms be trained on related laws and regulations on shrimp aquaculture
 - 10.4 Farms responsible for society and environment

When considering ACC: BAP Standard for hatchery, both schemes are also fully equivalent. Some specific issues to those equivalent criteria are also addressed in Thai COC, but not ACC, which are:

- 1.2 Hatchery located in an area of good-quality water
- 1.3 Hatchery not located near potential pollution sources
- 1.4 Hatchery has basic infrastructure and utilities

Table 4-6 Benchmarking results of ACC (Farm) & Thai COC-ThaiGAP

ACC	Thai COC	Benchmarking
		score
1. Farm has property right (land,	1.1 Farms with land title or at least 2	10
water, construction, operation)	years of renting from land	
and regulatory compliance	owner/government	
	1.7 Farm registered with the	10
	competent authority	
2. Farms shall not deny local	1.7 Farm registered with the	10
communities access to public	competent authority	
mangrove areas, fishing grounds or other public resources		
3. Farm shall comply with local	9.7 Farm should provide worker	10
and national labour laws (worker	welfare and living condition	10
safety, compensation, living	9.6 Farm pays wage according to	10
conditions)	labour laws	10
4. Farms shall not be located in	1.2 Farm located outside the	10
mangrove, not operated to cause	mangrove and consider carrying	
damage to wetland or	capacity of land	
biodiversity		
5. Farm shall monitor effluent	7.5 Farm should comply with	10
	effluent/sludge discharge standard	
6. Farms shall contain sediment	2.7 Farm maintain pond bottom,	10
from ponds and not cause	sludge removal is done properly	
salinization or ecological nuisance	7.9 Farm dispose sludge in a	10
in surrounding land and water	responsible manner	
7. Farm construction and	7.7 Farm should design wastewater	10
operations shall not cause soil	canals not to cause impacts to natural	
and water salinization or	receiving canals	
groundwater depletion	7.8 Farm not discharge water to fresh	10
	water and agriculture area	



9. Farms shall store fuel,	7.4 Farm should store fuel and	10
lubricants and chemicals and	lubricant safely and in a responsible	
dispose in a responsible manner	manner	
10. Farms shall not use banned	6.1 Farm sued veterinary drugs and	10
antibiotics, drugs and other	chemicals based on instructions,	
chemicals	withdrawal period, storage and disposal	
11. Farms shall treat human	7.11 Farm dispose wastes and sewage	10
waste and untreated animal	correctly	
manure in septic tanks and not	·	
contaminate areas		
12. Farms shall harvest and	8.1 Farms should have harvesting plan	10
transport with temperature	and quick sell for best freshness	
control and minimise physical	8.2 Farm check chemical residues	10
damage and contamination	before harvesting	
	8.3 Farm ensure no use of prohibited	10
	chemicals	10
	8.4 In case of hiring harvesters, shrimp	10
	farms should ensure no prohibited	10
	chemicals are used during harvesting	
	8.5 Shrimp farms should sell shrimp	
	directly to processors for best	10
	freshness	
	8.6 Shrimp farms should encourage	
	freshness control and clean ice	10
13. Farm - Product traceable to	11.Traceability	5
pond and inputs of origin (Trace	,	
Register online system)		
· · ·		

<u>Table 4-7</u> Benchmarking results of ACC (Hatchery) & Thai COC-ThaiGAP

BAP STANDARD:	Thai COC	Benchmarking
FOR HATCHERY		score
1. Hatchery has property right (land, water, construction,	1.1 Hatchery with land title or at least2 years of renting from land	10
operation) and regulatory	owner/government	
compliance	1.5 Hatchery registered with the competent authority	10
2. Hatchery shall not deny local	1.5 Hatchery registered with the	10
communities access to public	competent authority	
mangrove areas, fishing grounds		
or other public resources		
3. Hatchery shall comply with	8.6 Hatchery pays wage according to	10
local and national labour laws	labour laws	
(worker safety, compensation,	8.7 Hatchery should provide worker	10
living conditions)	welfare and living condition	



	7.8 Hatchery has sanitary systems for	5
	workers	
5. Hatchery shall establish health	3.1 Checking brood stock health	5
monitoring and control	before breeding	
procedure to minimise risk of	5.2 Hatchery has nursery for good	10
disease	health and pathogen free to pound	
	culture	
	5.4 Hatchery has measures to prevent	10
	disease outbreak from culture	
	management	
	5.5 Hatchery have measure to prevent	5
	diseases spread within Hatchery	
6. Hatchery shall monitor effluent	7.4 Hatchery should comply with	10
	effluent/sludge discharge standard	
8. Hatchery shall not release	7.8 Hatchery has sanitary systems for	3
untreated human sewage into	workers	
local ecosystem without proper	7.9 Farm dispose wastes and sewage	10
treatment	correctly	
9. Hatchery shall not use banned	6.5 Hatchery uses veterinary drugs	10
antibiotics, drugs and other	and chemical used accordance with	
chemical compounds (no	the instructions by government and	
prophylactic purpose)	national standard	
10. Hatchery -Product traceability	10.Traceability	5

<u>Table 4-8</u> Benchmarking results of ACC (Feed mill) & Thai COC-ThaiGAP

ACC	Thai COC	Benchmarking
		score
1. Feed mill shall comply with local/national laws and environmental regulations	4.1 Farm use good-quality feed, freshly produced, and not expire	3
2. Feed mill shall comply with local and national labour laws	9.6 Farm pays wage according to labour laws	10
(worker safety, compensation, living conditions)	9.7 Farm should provide worker welfare and living condition	10

Table 4-9 Benchmarking results of ACC (Feed mill) & Thai COC-ThaiGAP

ACC	Thai COC	Benchmarking
		score
2. Feed mill shall comply with	9.6 Farm pays wage according to	10
local and national labour laws	labour laws	
(worker safety, compensation,	9.7 Farm should provide worker	10
living conditions)	welfare and living condition	



Traceability criteria

In the social criteria for farm, both schemes are fully equivalent. Data records required for traceability system is rather similar (Table 4-10).

<u>Table 4-10</u> Traceability requirements of ACC and Thai COC

ACC traceability	Thai COC traceability
Pond identification number	Farm location
Pond area	Farm management
Stocking date	Stocking density
Quantity of post-larvae stocked	Feed and feeding
Source of post-larvae	Shrimp health management
Antibiotic and drug use	Veterinary drugs and chemicals
Herbicide, algaecide and other pesticide use	Wastewater and sludge
Manufacturer and lot number of each feed used	Social responsibility
Harvest date	Group and training
Harvest quantity	Accounting, financial and marketing
Sulphite use and protocol	
Processing plant or purchaser	

It should be noted that Thai COC also has several criteria that are linked to farming practices, which are:

- 1.3 Farm located in an area of good-quality water
- 1.4 Farm located in a near of good-quality soil for shrimp culture
- 1.5 Farms not located near potential pollution sources
- 1.6 Farm has basic infrastructure and utilities
- 3.1 Stocking density based on culturing technique, target, survival rate and size
- 3.2 Stocking density based on larval quality, size and age
- 3.3 Stocking density based on pond capacity

(7) ACC & Thai GAP

The benchmarking scores of ACC & Thai GAP (Details of equivalent criteria re given in Tables 4-11 to 4-14) are:

ACC: BAP standard for farm & Thai GAP farm

•	Social	100.00 %
•	Environmental	83.33 %
•	Food safety	100.00 %
•	Traceability	75.00 %
•	Average	89.58%



Environmental criteria

At the farm level, the environmental criteria of ACC & Thai GAP are fully equivalent, with additional criteria cover in Thai GAP. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not in ACC, which are:

Issue addressed in ACC: BAP Standard for farm but not in Thai GAP farm is:

8. Farms shall not use wild post-larvae and comply with regulations on imported seed stock

Food safety criteria

15 criteria of Thai GAP are matching with 3 criteria of ACC: BAP standard for farm – 12 criteria are fully equivalent, 3 criteria are highly equivalent.

Social criteria

12 criteria of Thai GAP farm are matching with 3 criteria of ACC: BAP standard for farm – 10 criteria are fully equivalent, 1 criterion is moderately equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not ACC, which are:

- 1.2 Farms located closed to good source of water
- 9.3 Shrimp farmer is recommended to apply to be membership of group/club/association which related to the profession
- 9.4 Shrimp farmer is recommended to participate to seminar and/or training on related environmental friendly shrimp culture techniques

<u>Table 4-11</u> Benchmarking results of ACC (Farm) & Thai COC-ThaiGAP

ACC	Thai GAP	Benchmarking
		score
1. Farm has property right (land,	1.6 Farms must be located outside	10
water, construction, operation)	mangrove and/or conserved wetlands.	
and regulatory compliance	1.7 Farms must be located outside the	10
	prohibited areas/zone as indicated by	
	law.	
	1.5 Farms have title to land or own	10
	legal rights for land use	
	1.4 Farms registration with	10
	Department of Fisheries	
2. Farms shall not deny local	9.1 Shrimp farm must not block the	10
communities access to public	traditional access route to public	
mangrove areas, fishing grounds	resources and/or disturb traditional	
or other public resources	lifestyle	
	9.2 Shrimp farm is recommended to	5
	provide support and assist to the local	
	community	
3. Farm shall comply with local	5.4 Safety electricity system should be	10
and national labour laws (worker	provided	



safety, compensation, living conditions)	8.1 Legal worker employment must be performed	3
	8.2 Legal worker wages must be applied.	10
	8.3 Shrimp farm is recommended to provide appropriated worker and	10
	welfare 8.4 Shrimp farm is recommended to provide enough and safety equipments for farm work	10
	8.5 Shrimp farm is recommended to provide adequate training on work safety practices	10
4. Farms shall not be located in mangrove, not operated to cause	1.6 Farms must be located outside mangrove and/or conserved wetlands.	10
damage to wetland or biodiversity	1.7 Farms must be located outside the prohibited areas/zone as indicated by law	10
	2.6 Water filtering system installed to prevent the entering of shrimp	5
	predators to farm 2.12 Prevention of predators and disease carriers to entering the ponds	5
5. Farm shall monitor effluent	2.2 Measurement of quality in source water according to the operation manual	3
	2.9 Efficient feed management	3
	2.11 Routine analysis of water qualities in shrimp culture pond	5
	4.1 Effluent qualities must meet the national effluent standard for aquaculture farm	10
	4.2 Shrimp farm effluent should not be discharged unless it was treated before discharge	10
6. Farms shall contain sediment from ponds and not cause	2.3 Resting and/or preparation of pond before start the next crop	3
salinization or ecological nuisance in surrounding land and water	4.3 Shrimp farm should prevent environmental impact of discharged saline water on freshwater/agricultural area.	10
	4.4 Sludge from shrimp farm should not be discharged into public or non-permitted area	10
8. Farms shall not use wild post- larvae and comply with regulations on imported seed	2.4 Stocking of shrimp larvae at the appropriate density2.5 Availability of record/	10
<u> </u>		



stock	certification/ test report of larval	10
9. Farms shall store fuel, lubricants and chemicals and	5.1 Fuel and lubricant should be stored safety and in a responsible	10
dispose in a responsible manner	manner 5.2 Mechanical machine used in farm should be in good condition without leakage of fuel or lubricant in to source water	10
	5.3 Lubricant is recommended to disposed or eliminated in a responsible manner	10
10. Farms shall not use banned antibiotics, drugs and other	2.13 Routine monitoring of shrimp health	10
chemicals	2.14 In case of poor health, disease should be diagnosed, the cause and measure should be made	10
	2.15 Availability of prevention measure and efficiently disease outbreak control plan.	10
	2.16 In case of disease outbreak should be inform to the control authority	10
	3.1 Not use banned and unregistered veterinary drugs, chemical, hazardous materials and probiotics drugs	5
	3.2 If authorized drug or chemical is applied, withdrawal period must be strictly performed or restriction of use according to the instruction	10
	3.3 Authorized drugs, chemicals and probiotics stored in an appropriate manner	10
	6.1 Used drug/ chemical containers should be disposed of in a responsible manner in order to prevent contamination	10
11. Farms shall treat human waste and untreated animal manure in septic tanks and not	6.2 Shrimp farm should provide appropriate hygienic garbage management and pest control	5
contaminate areas	6.3 Good hygienic toilet , avoid contamination of domestic sewage into grow-out pond, reservoir and canal	10
	6.4 Untreated animal manure must not be used 6.5 No pet should be allowed in the	10



	production area of the farm	5
12. Farms shall harvest and transport with temperature	7.1 No prohibited chemicals must be used during shrimp harvest	10
control and minimise physical damage and contamination	7.4 Harvest should be done in a good manner	10
	7.2 Using of authorized chemical in the	10
	appropriate manner	
13. Farm - Product traceable to pond and inputs of origin (Trace	2.1 Farm must have and operate according to operational manual	10
Register online system)	2.8 Used certified feed and not expire feed. On-site feed production must declare list of materials and must not use the prohibited materials	10
	10.1 Shrimp fry movement document (FMD) and movement document (MD)	10
	10.2 Record of veterinary drug, chemical, hazardous materials and probiotics	10
	10.3 Records of all relevant data of inputs and outputs should be available for the inspection	10

<u>Table 4-12</u> Benchmarking results of ACC (Hatchery) & Thai COC-ThaiGAP

BAP STANDARD:	Thai GAP	Benchmarking
FOR HATCHERY		score
1. Hatchery has property right	1.7 Farms must be located outside the	10
(land, water, construction,	prohibited areas/zone as indicated by	
operation) and regulatory	law	
compliance	1.5 Farms have title to land or own	10
	legal rights for land use	
2. Hatchery shall not deny local	9.1 Shrimp farm must not block the	10
communities access to public	traditional access route to public	
mangrove areas, fishing grounds	resources and/or disturb traditional	
or other public resources	lifestyle	
	9.2 Shrimp farm is recommended to	10
	provide support and assist to the local	
	community	
3. Hatchery shall comply with	8.1 Legal worker employment must be	10
local and national labour laws	performed	
(worker safety, compensation,	8.2 Legal worker wages must be	3
living conditions)	applied.	
	8.3 Shrimp farm is recommended to	10



	provide appropriated worker and welfare 8.4 Shrimp farm is recommended to provide enough and safety	10
	equipments for farm work 8.5 Shrimp farm is recommended to provide adequate training on work safety practices	10
	5.4 Safety electricity system should be provided	10
4. Hatchery shall not be located in mangrove, not operated to cause	1.6 Farms must be located outside mangrove and/or conserved wetlands	10
damage to wetland or biodiversity	1.7 Farms must be located outside the prohibited areas/zone as indicated by law	10
	2.6 Water filtering system installed to prevent the entering of shrimp predators to farm	5
	2.12 Prevention of predators and disease carriers to entering the ponds	5
5. Hatchery shall establish health	2.13 Routine monitoring of shrimp	10
monitoring and control procedure to minimise risk of disease	health 2.14 In case of poor health, disease should be diagnosed, the cause and measure should be made	10
	2.15 Availability of prevention measure and efficiently disease outbreak control plan	10
	2.16 In case of disease outbreak should be inform to the control authority	10
6. Hatchery shall monitor effluent	2.2 Measurement of quality in source water according to the operation manual	3
	2.9 Efficient feed management	5
	2.11 Routine analysis of water	3
	qualities in shrimp culture pond	
	4.1 Effluent qualities must meet the national effluent standard for aquaculture farm	10
	4.2 Shrimp farm effluent should not be discharged unless it was treated before discharge	10
7. Hatchery shall store fuel, lubricants and chemicals and dispose in a responsible manner	5.1 Fuel and lubricant should be stored safety and in a responsible manner	10



	5.2 Mechanical machine used in farm should be in good condition without leakage of fuel or lubricant in to source water	10
	5.3 Lubricant is recommended to disposed or eliminated in a responsible manner.	10
8. Hatchery shall not release untreated human sewage into local ecosystem without proper	6.2 Shrimp farm should provide appropriate hygienic garbage management and pest control	5
treatment	6.3 Good hygienic toilet, avoid contamination of domestic sewage into grow-out pond, reservoir and canal	10
	6.4 Untreated animal manure must not be used	10
	6.5 No pet should be allowed in the production area of the farm	5
9. Hatchery shall not use banned antibiotics, drugs and other chemical compounds (no prophylactic purpose)	3.1 Not use banned and unregistered veterinary drugs, chemical, hazardous materials and probiotics drugs 3.2 If authorized drug or chemical is	10
propriyiactic purpose)	applied, withdrawal period must be strictly performed or restriction of use according to the instruction	5
	3.3 Authorized drugs, chemicals and probiotics stored in an appropriate manner	10
	6.1 Used drug/ chemical containers should be disposed of in a responsible manner in order to prevent contamination	10

<u>Table 4-13</u> Benchmarking results of ACC (Feed mill) & Thai COC-ThaiGAP

ACC	Thai GAP	Benchmarking
		score
1. Feed mill shall comply with	2.8 Used certified feed and not expire	10
local/national laws and	feed. On-site feed production must	
environmental regulations	declare list of materials and must not	
	use the prohibited materials	
2. Feed mill shall comply with	8.1 Legal worker employment must be	10
local and national labour laws	performed	
(worker safety, compensation,	8.2 Legal worker wages must be	3
living conditions)	applied.	



8.3 Shrimp farm is recommended to	
provide appropriated worker and	10
welfare	
8.4 Shrimp farm is recommended to	
provide enough and safety equipments for farm work	10
8.5 Shrimp farm is recommended to	
provide adequate training on work	10
safety practices	10
5.4 Safety electricity system should be	
provided	10
	10

Table 4-14 Benchmarking results of ACC (Feed mill) & Thai COC-ThaiGAP

ACC	Thai GAP	Benchmarking
		score
2. Feed mill shall comply with local and national labour laws	8.1 Legal worker employment must be performed	10
(worker safety, compensation, living conditions)	8.2 Legal worker wages must be applied.	3
	8.3 Shrimp farm is recommended to provide appropriated worker and welfare	10
	8.4 Shrimp farm is recommended to provide enough and safety equipments for farm work	10
	8.5 Shrimp farm is recommended to provide adequate training on work safety practices	10
	5.4 Safety electricity system should be provided	10

Traceability

Traceability of ACC: BAP standard for farm and Thai GAP farm is moderately equivalent, as ACC requires more data records (Table 4-11).

<u>Table 4-15</u> Traceability requirements of ACC and Thai COC

ACC traceability	Thai COC traceability
	2.1 Farm must have and operate according to
Pond identification number	operational manual
	2.8 Used certified feed and not expire feed. On-site
	feed production must declare list of materials and
Pond area	must not use the prohibited materials



	10.1 Shrimp fry movement document (FMD) and
Stocking date	movement document (MD)
	10.2 Record of veterinary drug, chemical, hazardous
Quantity of post-larvae stocked	materials and probiotics
	10.3 Records of all relevant data of inputs and
Source of post-larvae	outputs should be available for the inspection
Antibiotic and drug use	
Herbicide, algaecide and other pesticide	
use	
Manufacturer and lot number of each	
feed used	
Harvest date	
Harvest quantity	
Sulphite use and protocol	
Processing plant or purchaser	

^{*}For hatchery, Thai GAP does not address any criteria that ACC does.

(8) Thai GAP & the FAO Technical Guideline

The benchmarking scores of Thai GAP & the FAO Technical Guideline (Details of equivalent criteria re given in Tables 4-16) are:

Thai GAP & the FAO Technical Guideline

•	Environmental	69.00 %
•	Food safety	90.00 %
•	Animal welfare	71.00 %
•	Social	30.00 %
•	Average	65.00%

Environmental criteria

The environmental criteria of Thai GAP & the FAO Technical Guideline are only 7 criteria of Thai GAP matching with 9 criteria of FAO Technical Guideline, 2 criteria are fully equivalent, 3 criteria are highly equivalent and 2 criteria are moderately equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not in FAO, which are:

- 2.9 Farm is recommend to have efficient feed management which is sufficient to feeding of shrimp
- 2.7 Aerator should be positioned correctly and operated efficiently
- 4.4 Sludge from shrimp farm should not be discharged into public or non-permitted area



- 5.5 Shrimp farm should provide measure on energy saving and alternative energy sources.
- 10.1 Shrimp fry movement document (FMD) and movement document (MD) must be available.

Food safety criteria

17 criteria of Thai GAP farm are matching with 10 criteria of FAO Technical Guideline – 12 criteria are fully equivalent, 4 criterion is highly equivalent and 1 moderately equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not FAO, which are:

- 3.3 Authorized drugs, chemicals and probiotics is recommended to stored in an appropriate manner.
- 5.1 Fuel and lubricant should be stored safety and in a responsible manner.

Animal welfare_criteria

7 criteria of Thai GAP farm are matching with 9criteria of FAO Technical Guideline -3 criteria are fully equivalent, 2 criterion is highly equivalent and 2 moderately equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not FAO, which are:

- 2.14 In case of poor health, disease should be diagnosed, the cause and measure should be made
- 2.16 In case of disease outbreak should be inform to the control authority
- 10.1 Shrimp fry movement document (FMD) and movement document (MD) must be available
- 2.6 Water filtering system should be cautiously installed to prevent the entering of shrimp predators to farm

Social criteria

3 criteria of Thai GAP farm are matching with 9 criteria of FAO Technical Guideline - 3 criteria are fully equivalent. Some specific issues to those equivalent criteria are also addressed in Thai GAP, but not FAO, which are:

- 1.3 Farm recommended to be easily accessible to road or any transportation both outside and inside the farm
- 5.4 Safety electricity system should be provided.
- 8.5 Shrimp farm is recommended to provide adequate training on work safety practices.
- 9.3 Shrimp farmer is recommended to apply to be membership of group/club/association which related to the profession.
- 9.4 Shrimp farmer is recommended to participate to seminar and/or training on related environmental friendly shrimp culture techniques



<u>Table 4-16</u> Benchmarking results of Thai GAP & the FAO Technical Guideline

Environmental Integrity

FAO	Thai GAP	Benchmarking
140	That GAI	score
35. Aquaculture should be planned	1.4 Farm must register with	5
and practiced in an	Department of Fisheries	
environmentally responsible	1.5 Owner must have title to land or	10
manner, in accordance with	own legal rights for land use	
appropriate local, national and	1.6 Farm must be located outside	10
international laws and regulations.	mangrove and/or conserved wetlands.	
_	1.7 Farm must be located outside the	10
	prohibited areas/zone as indicated by	
	law.	
37. Aquaculture can impact on the	4.1 Effluent qualities must meet the	5
environment and aquaculture	national effluent standard for	
certification schemes should	aquaculture farm.	
ensure these impacts are		
identified and adverse impacts are		
managed or mitigated to an		
acceptable level in accordance		
with local and national laws.		
Whenever possible, native species		
should be used for culture and		
measures should be taken to		
minimize unintentional release or		
escape of cultured species into		
natural environments.		
Minimum substantive criteria for		
addressing environmental		
integrity in aquaculture		
certification schemes		10
43. Regular monitoring of on-farm	1.2 Located closed to good source of	10
and off-farm environmental quality	water for used in shrimp culture i.e.	40
should be carried out , combined	2.1 Farm must have and operate	10
with good record keeping and use	according to operational manual	10
of appropriate methodologies.	2.2 Measurement of quality in source	10
	water according to the operation	
	manual is recommended.	F
	2.3 Resting and/or preparation of	5
	pond before start the next crop is	
	recommended	10
	2.11 Routine analysis of water qualities in shrimp culture pond	10
AE Mossures should be adouted	· · · · · · · · · · · · · · · · · · ·	10
45. Measures should be adopted	4.1 Effluent qualities must meet the	10



to promote efficient water	national effluent standard for	
management and use as well as	aquaculture farm.	
proper management of effluents	4.2 Shrimp farm effluent should not	10
to reduce impacts on surrounding	be discharged unless it was treated	
land and water resources should	before discharge.	
be adopted.	4.3 Shrimp farm should prevent	10
	environmental impact of discharged	
	saline water on	
	freshwater/agricultural area.	

Food Safety and Quality

FAO	Thai GAP	Benchmarking
		score
25. Aquaculture activities should be conducted in a manner that ensures food safety by implementing appropriate national or international standards and regulations including those defined by FAO/WHO Codex Alimentarius. Although Codex Alimentarius covers both safety and quality issues concerning aquatic products, for the purpose of these guidelines, quality aspects are not currently addressed in detail.	5.1 Fuel and lubricant should be stored safety and in a responsible manner	5
26. Aquaculture facilities should be located in areas where the risk of contamination is minimized and where sources of pollution can be controlled or mitigated.	1.1 Must not site in the environment that risk for contamination which affects to shrimp health and safety of consumer	10
27. Where feed is used, aquaculture operations should include procedures for avoiding feed contamination in compliance with national regulations or as determined by internationally agreed standards. Aquaculture operations should use feeds and feed ingredients which do not contain unsafe levels of pesticides, biological, chemical and physical contaminants and or other adulterated substances. Feed which is manufactured or	2.8 Used the registered or certified or quality tested feed from the authorized laboratory and feed should have good quality and do not expire. In case of farmer produce feed themselves, they must declare list of materials and must not use the prohibited materials. 2.10 Feed should be stored in the safety place that be able to prevent the contamination and maintain quality of feed	10 5



	<u> </u>	
contain only substances permitted		
by the national competent		
authorities		
28. All veterinary drugs and	3.1 Veterinary drugs, chemical,	10
chemicals for use in aquaculture	hazardous materials and probiotics	
shall comply with national	used in aquaculture must be	
regulations, as well as	registered with the authority and used	
international guidelines. Wherever	in responsible manner. Farm must not	
applicable, veterinary drugs and	use prohibited drugs and chemicals	
chemicals should be registered	hazardous materials and probiotics.	
with the competent national	3.2 If authorized drug or chemical is	10
authority. Veterinary drugs should	applied, withdrawal period must be	
be scheduled (classified). Control	strictly performed or restriction of use	
of diseases with veterinary drugs	according to the instruction	
and antimicrobials should be	7.1 No prohibited chemicals must be	10
carried out only on the basis of an	used during shrimp harvest.	
accurate diagnosis and knowledge		
that the drug is effective for		
control or treatment of a specific		
disease. In some classifications,		
veterinary drugs may only be		
prescribed and distributed by		
personnel authorized under		
national regulations. All veterinary		
drugs and chemicals or medicated		
feeds should be used according to		
the instructions of the		
manufacturer or other competent		
authority, with particular attention		
to withdrawal periods. Banned		
non-registered and/or non		
permitted antimicrobial agents,		
veterinary drugs and/or chemicals		
must not be used in aquaculture		
production, transportation or		
product processing. Prophylactic		
use of veterinary medicine		
products, particularly antimicrobial		
agents, should not take place.		
31. Traceability and record-	10.2 Should record the data ie.	10
keeping of farming activities and	10.2 Should record the data le. 10.3 Records of all relevant data of	10
inputs which impact food safety	inputs and outputs should be available	10
	for the inspection	
,	Tor the inspection	
documenting, inter alia:		
the source of inputs such seed seed veterinary		
as feed, seed, veterinary		
drugs and antibacterial,		



additives, chemicals;		
 type, concentration, 		
dosage, method of		
administration and		
withdrawal times of		
chemicals, veterinary		
drugs and antibacterial		
and the rationale for		
their use.		
32. Aquaculture facilities and	5.3 Lubricant is recommended to	3
operations should maintain good	disposed or eliminated in a	3
culture and hygienic conditions,	responsible manner.	
including:	6.3 Toilet must be constructed in good	10
_	_	10
Good hygiene practices in the farm surroundings	hygienic manner and shrimp farm	
in the farm surroundings	must avoid contamination of domestic	
should be applied aiming	sewage into grow-out pond, reservoir	
at minimizing	and canal.	
contamination of	6.4 Untreated animal manure must	10
growing water,	not be used.	
particularly from waste	6.5 No pet should be allowed in the	10
materials or faecal	production area of the farm.	
matter from animals or	6.2 Shrimp farm should provide	10
humans	appropriate hygienic garbage	
Good Aquaculture	management and pest control	
Practices should be	7.4 Harvest should be done in a good	10
applied during culture to	manner.	
ensure good hygienic	7.3 used the buyer / collector that has	3
culture conditions and	be certified for the	
safety and quality of	harvest/postharvest hygienic	
aquaculture produce	standard or that has registered to	
 Farms should institute a 	Department of Fisheries	
pest control programme,		
so that rodents, birds		
and other wild and		
domesticated animals		
are controlled, especially		
around feed storage		
areas		
Farm grounds should be		
well maintained to		
reduce or eliminate food		
and feed safety hazards		
 Appropriate techniques 		
for harvesting, storing		
and transportation of		
aquaculture products		
should be applied to		



minimize contamination	
and physical damage.	

Animal Health and Welfare

FAO	Thai GAP	Benchmarking score
17. Aquaculture activities should be conducted in a manner that assures the health and welfare of	2.14 In case of poor health, disease should be diagnosed, the cause and measure should be made	5
farmed aquatic animals, by optimizing health through minimizing stress, reducing aquatic animal disease risks and maintaining a healthy culture environment at all phases of the production cycle. Guidelines and standards set by OIE should be the specific normative basis.	2.15 Availability of prevention measure and efficiently disease outbreak control plan.	5
Minimum substantive criteria for addressing environmental		
integrity in aquaculture		
certification schemes 18. Aquaculture operations should implement aquatic animal health management programmes set up in compliance with relevant national legislation and regulations, taking into account the FAO CCRF Technical Guidelines on Health Management for Responsible Movement of Live Aquatic Animals and relevant OIE Standards.	2.5 Availability of record/certification/test report of larval health	10
	2.16 In case of disease outbreak should be inform to the control authority	5
species raised, to benefit aquatic animal health and welfare, and	2.4 Stocking of shrimp larvae at the appropriate density	10
reduce the risks of introduction and spread of aquatic animal	2.13 Routine monitoring of shrimp health	10
diseases. In particular by	2.11 Routine analysis of water qualities in shrimp culture pond	10



Allowing for	, ,	5
quarantining of stock	predators and disease carriers to	
	entering the ponds during pond, water	
Routine monitoring of	preparation and shrimp culture	
stock and	period	
environmental		
conditions for early		
detection of aquatic		
animal health		
problems		
Implementation of		
Implementation of		
management practices that reduce the		
likelihood of disease		
transmission within and		
between aquaculture		
facilities and natural		
aquatic fauna, and		
reduce stress on		
animals for the purpose		
of optimizing health.		
21. Veterinary medicines should be	7.2 Using of authorized chemical in	10
used in responsible manner and in	the appropriate manner	
accordance with applicable		
national legislation or relevant		
international agreements that		
ensure effectiveness, safety of		
public and animal health and		
protection of the environment.		

Social Responsibility

FAO	Thai GAP	Benchmarking
		score
51. Aquaculture should be	8.4 Shrimp farm is recommended to	10
conducted in a socially responsible	provide enough and safety	
manner, within national rules and	equipments for farm work	
regulations, having regard to the	9.2 Shrimp farm is recommended to	10
ILO-convention on labour rights,	provide support and assist to the local	
not jeopardizing the livelihood of	community.	
aquaculture workers, and local		
communities. Aquacultures		
contribute to rural development,		
enhance benefits and equity in		
local communities, alleviate		
poverty and promote food		



		1
security. As a result, socio-		
economic issues should be		
considered at all stages of		
aquaculture planning,		
development and operation.		
52. The importance of corporate	9.1 Shrimp farm must not block the	5
social responsibility from	traditional access route to public	
aquaculture to local communities	resources and/or disturb traditional	
should be recognized.	lifestyle	
Minimum substantive criteria for		
addressing environmental		
integrity in aquaculture		
certification schemes		
-		
56. Workers should be treated	8.1 Legal worker employment must be	10
responsibly and in accordance with	performed	
national labour rules and	8.3 Shrimp farm is recommended to	10
regulations and, where	provide appropriated worker welfare	
appropriate, relevant ILO	and	
conventions.		
57. Workers should be paid wages	8.2 Legal worker wages must be	10
and provided benefits and working	applied.	
conditions according to national	• •	
laws and regulations.		
laws and regulations.		

2.3 Applicability of certification criteria

2.3.1 GLOBALG.A.P.

In terms of applicability, the results have shown that (Table 4-17):

All farm-base module 13 criteria are highly applicable, 25 criteria are moderately

applicable, 3 criteria are slightly applicable

Applicability score = 61.33%

Aquaculture-base module 39 criteria are highly applicable, 61 criteria are moderately

applicable, 35 criteria are slightly applicable, 12 criteria are

tiny applicable.

Applicability score = 54.42%

Shrimp-species module 14 criteria are highly applicable, 4 criteria are moderately

applicable, 4 criteria is slightly applicable, 1 criterion is tiny

applicable.

Applicability score = 67.27%



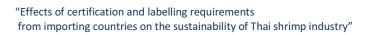
Social module

11 criteria are highly applicable, 9 criteria are moderately applicable, 1 criterion is slightly applicable Applicability score = 64.23%

Average applicability score = 59.19%

<u>Table 4-17</u> Applicability Score (AS) of GLOBALG.A.P.

GLOBALG.A.P. criteria	Number of criteria			
	AS = 10	AS = 5	AS = 3	AS = 0
GLOBAL G.A.P.	77	109	47	13
ALL FARM-BASE MODULE	13	25	7	0
AF 1. RECORD KEEPING	0	2	1	0
AF 2. SITE HISTORY AND SITE MANAGEMENT	1	3	0	0
AF 2.1 Site History	1	1	0	0
AF 2.2 Site Management	0	2	0	0
AF 3. WORKERS HEALTH, SAFETY AND WELFARE	8	12	2	0
AF 3.1 Risk Assessments	0	2	0	0
AF 3.2 Training	3	4	1	0
AF 3.3 Hazards and First Aid	1	3	0	0
AF 3.4 Protective Clothing/Equipment	2	0	0	0
AF 3.5 Worker Welfare	2	2	1	0
AF 3.6 Subcontractors	0	1	0	0
AF 4. WASTE AND POLLUTION MANAGEMENT, RECYCLING	3	0	2	0
AND RE-USE				
AF 4.1 Identification of Waste and Pollutants	1	0	0	0
AF 4.2 Waste and Pollution Action Plan	2	0	2	0
AF 5. ENVIRONMENT AND CONSERVATION	0	8	0	0
AF 5.1 Impact of Farming on the Environment and	0	6	0	0
Biodiversity				
AF 5.2 Unproductive Sites	0	1	0	0
AF 5.3 Energy Efficiency	0	1	0	0
AF 6. COMPLAINTS	0	0	2	0
AF 7. TRACEABILITY	1	0	0	0
AQUACULTURE-BASE MODULE	39	61	35	12
AB 1. SITE MANAGEMENT	3	10	7	3
AB 1.1 Management and Documentation	1	1	3	1
AB 1.2 Site Management	1	6	3	2
AB 1.3 Site Entry	1	3	1	0
AB 2. CHEMICALS	6	9	4	1
AB 2.1 Chemical Storage	5	6	0	1
AB 2.2 Empty Containers	1	2	3	0
AB 2.3 Transport of chemical containers	0	1	1	0
AB 3. PEST CONTROL	0	1	1	1
AB 4. OCCUPATIONAL HEALTH AND SAFETY	2	7	0	0





		ı	T	ı
AB 4.1 Training	1	1	0	0
AB 4.2 Health and Safety	0	4	0	0
AB 4.3 Legislative Framework	1	2	0	0
AB 5. FISH WELFARE, MANAGEMENT AND HUSBANDRY	16	16	14	6
AB 5.1 Sourcing, Identification and Traceability	3	1	1	4
AB 5.2 Fish Health & Welfare	5	3	4	0
AB 5.3 Medicines	2	2	1	0
AB 5.4 Medicine Records	1	1	0	0
AB 5.5 Vaccination Procedures and Treatments	0	3	1	0
AB 5.6 Mortality	3	0	0	1
AB 5.7 Fish Holding Area	1	0	1	1
AB 5.8 Fasting, Harvesting and Transport	0	0	3	0
AB 5.9 Machinery and Equipment	1	6	3	0
AB 6. AQUACULTURE FEED	3	3	4	0
AB 6.1 General	1	0	1	0
AB 6.2 Feed Records	2	2	2	0
AB 6.3 Storage of Aquaculture Feeds	0	1	1	0
AB 7. ENVIRONMENTAL AND BIODIVERSITY MANAGEMENT	6	8	0	0
AB 7.1 Environmental Management	3	4	0	0
AB 7.2 Energy Efficiency	1	0	0	0
AB 7.3 Waste	0	1	0	0
AB 7.4 Nitrate and Phosphate Levels in Drain Water	0	2	0	0
AB 7.5 Predator Control	1	1	0	0
AB 7.6 Escapes and Non-Indigenous Species	1	0	0	0
AB 8 WATER USAGE AND DISPOSAL	1	5	4	1
AB 8.1 General	0	4	4	1
AB 8.2 Supply / Quality of Ice	1	1	0	0
AB 9. CAGE PRODUCTION	0	0	1	0
AB 10 SAMPLING AND TESTING	2	2	0	0
SHRIMP-SPECIES MODULE	14	14	4	1
SP 1. HATCHERIES AND NURSERIES	5	5	2	1
SP 1.1 Broodstock sources	3	2	0	0
SP 1.2 Nauplii and post larvae sources	2	3	1	1
SP 1.3 Hatchery Water supply	0	0	1	0
SP 2 HUSBANDRY ON THE FARM	0	1	1	1
SP 2.1 Frequency of Mortality Inspection	0	0	0	1
SP 2.2 Hygiene and pest control	0	1	1	0
SP 3.FEED AT HATCHERIES	1	1	0	0
SP 4. HARVESTING	2	4	1	0
SP 4.1 Method of packing/dispatch	0	3	0	0
SP 4.2 Labelling / Traceability of Harvested shrimp	2	1	1	0
SP 5. MANGROVE, PROTECTED AREA AND OTHER HIGH	6	2	0	0
CONSREVATION VALUE AREAS				
SP 6. SOCIAL CRITERIA	0	1	0	0
SOCIAL CRITERIA	11	9	1	0



SC 1.1 SOCIAL CRITERIA	1	0	0	0
SC 1.2 LEGISLATIVE AND GOVERNACE	8	7	0	0
SC 2 SOCIAL ENVIRONMENT	2	2	1	0

2.3.2 ACC

In terms of applicability, the results have shown that (Table 4-18):

BAP standard for farm 26 criteria are highly applicable, 12 criteria are

moderately applicable

Applicability score = 100%

BAP standard for hatchery 10 criteria are highly applicable

Applicability score = 100%

BAP standard for feed mill 7 criteria are highly applicable

Applicability score = 100%

BAP standard for processing plant 8 criteria are highly applicable

Applicability score = 100%

Average applicability score = 100%

<u>Table 4-18</u> Applicability Score (AS) of ACC

ACC criteria	Number of criteria			
	AS = 10	AS = 5	AS = 3	AS = 0
BAP STANDARD FOR FARM		0	0	0
1. Farm has property right (land, water, construction, operation) and regulatory compliance	1	0	0	0
2. Farms shall not deny local communities access to public mangrove areas, fishing grounds or other pubic resources	1	0	0	0
3. Farm shall comply with local and national labour laws (worker safety, compensation, living conditions)	1	0	0	0
4. Farms shall not be located in mangrove, not operated to cause damage to wetland or biodiversity	1	0	0	0
5. Farm shall monitor effluent	1	0	0	0
6. Farms shall contain sediment from ponds and not cause salinization or ecological nuisance in surrounding land and water		0	0	0
7. Farm construction and operations shall not cause soil and water salinization or groundwater depletion	1	0	0	0
8. Farms shall not use wild post-larvae and comply with regulations on imported seed stock	1	0	0	0
9. Farms shall store fuel, lubricants and chemicals and dispose in a responsible manner	1	0	0	0



10. Farms shall not use banned antibiotics, drugs and other	1	0	0	0
chemicals				
11. Farms shall treat human waste and untreated animal	1	0	0	0
manure in septic tanks and not contaminate areas				
12. Farms shall harvest and transport with temperature	1	0	0	0
control and minimise physical damage and contamination				
13. Farm - Product traceable to pond and inputs of origin	1	0	0	0
(Trace Register online system)				
BAP STANDARD FOR HATCHERY	10	0	0	0
1. Hatchery has property right (land, water, construction,	1	0	0	0
operation) and regulatory compliance				
2. Hatchery shall not deny local communities access to	1	0	0	0
public mangrove areas, fishing grounds or other public				
resources				
3. Hatchery shall comply with local and national labour laws	1	0	0	0
(worker safety, compensation, living conditions)				
4. Hatchery shall not be located in mangrove, not operated	1	0	0	0
to cause damage to wetland or biodiversity				
5. Hatchery shall establish health monitoring and control	1	0	0	0
procedure to minimise risk of disease				
6. Hatchery shall monitor effluent	1	0	0	0
7. Hatchery shall store fuel, lubricants and chemicals and	1	0	0	0
dispose in a responsible manner				
8. Hatchery shall not release untreated human sewage into	1	0	0	0
local ecosystem without proper treatment				
9. Hatchery shall not use banned antibiotics, drugs and other	1	0	0	0
chemical compounds (no prophylactic purpose)				
10. Hatchery -Product traceability	1	0	0	0
BAP STANDARD FOR FEED MILL	7	0	0	0
1. Feed mill shall comply with local/national laws and	1	0	0	0
environmental regulations	_			
2. Feed mill shall comply with local and national labour laws	1	0	0	0
(worker safety, compensation, living conditions)	_			Ü
3. Feed mills shall reduce dependence on wild fisheries and	1	0	0	0
obtain fishmeals and oils from sustainable sources	_			Ü
4. Feed mill shall label, store, use and dispose fuel, lubricants	1	0	0	0
and chemicals and dispose in a responsible manner	_			Ü
5. Feed mill shall dispose refuses in a responsible and bio	1	0	0	0
secure manner	_			Ü
6. Feed mills shall have current, systematic, documented	1	0	0	0
process controls with good manufacturing practice to	_			O
minimise food safety hazards				
7. Feed mill - Product traceable to pond and inputs of origin	1	0	0	0
(Trace Register online system)	_			
BAP STANDARD FOR PROCESSING PLANT	8	0	0	0
Processing plant shall comply with local/national laws and	1	0	0	0
1. Frocessing plant shall comply with local/hational laws and	1	U	U	U



		ı	
1	0	0	0
1	0	0	0
1	0	0	0
1	0	0	0
1	0	0	0
1	0	0	0
1	0	0	0
	1 1 1 1	1 0 1 0 1 0 1 0 1 0	

2.3.3 Organic, Naturland

Social responsibility

In terms of applicability, the results have shown that (Table 4-19):

Principles of management	9 criteria are highly applicable, 1-criteria are moderately applicable, criteria are slightly applicable, criterion is tiny applicable. Applicability score = 60.34%		
Supplementary for the pond culture of shrimp	8 criteria are highly applicable, 18 criteria are moderately applicable, 3 criteria are slightly applicable, 1 criterion is tiny applicable. Applicability score = 59.67 %		

2 criteria are highly applicable, 9 criteria are moderately applicable, 1 criterion is slightly applicable, 1 criterion is tiny applicable.

Applicability score = 52.31%

Average applicability score = 58.61%



<u>Table 4-19</u> Applicability score of Organic, Naturland

NATURLAND criteria	Number of criteria			
	AS = 10	AS = 5	AS = 3	AS = 0
NATURLAND STANDARD	19	41	9	3
Principles of management	9	14	5	1
1. Selection of site, interaction with surrounding	1	3	2	0
ecosystems				
2. Species and origin of stock	1	2	0	0
3. Breeding, hatchery management	0	0	2	0
4. Design of holding systems, water quality, stocking	1	0	1	0
density				
5. Health and hygiene	2	0	0	0
6. Oxygen supply	0	1	0	0
7. Organic fertilising	0	2	0	0
8. Feeding	2	4	0	1
9. Transport, slaughtering and processing	1	2	0	0
10. Smoking	1	0	0	0
Supplementary for the pond culture of shrimp	8	18	3	1
1. Site selection, protection of mangrove	2	1	0	0
2. Protection of ecosystem - farm area and	1	6	0	0
surrounding				
3. Species and origin of stock	0	2	0	0
4. Hatchery management	1	1	2	0
5. Pond design, water quality, stocking density	1	2	0	0
6. Health and hygiene	1	2	1	0
7. Fertilising of pond	0	1	0	0
8. Feeding	1	1	0	0
9. Harvesting and processing	1	1	0	1
Social responsibility	2	9	1	1
1. Human rights/They must com-ply at the minimum	1	0	0	0
with the local legal requirements				
2. Forced labour/The operations commit themselves	0	1	0	0
to rejecting forced labour				
3. Freedom of association, access to trade unions	0	1	0	0
4. Equal treatment and opportunities	0	1	0	0
5. Child labour/No children may be employed on	0	1	0	0
farms. Children may work on the farms of their own				
families or a neighbouring farm				
6. Health and safety/All workers, employees and	0	1	0	0
their families shall have access to drinking water,				
food, accommodation and basic medical care				
7. Employment conditions	1	4	1	1



2.3.4 Thai GAP

In terms of applicability, the results have shown that (Table 4-20):

Thai GAP 23 criteria are highly applicable, 30 criteria are moderately

applicable, 2 criteria are slightly applicable, 1 criteria are tiny

applicable

Applicability score = 68.93%

Table 4-20 Applicability score of ThaiGAP

Thai GAP criteria	Number of criteria			
	AS = 10	AS = 5	AS = 3	AS = 0
Thai GAP	23	30	2	1
1. Farm site and registration	2	5	0	0
2. Farm management	7	9	0	0
3. Use of veterinary drugs, chemical, hazardous	2	1	0	0
material and probiotics				
4. Effluent and sludge management	2	2	0	0
5. Energy and fuel	1	3	0	1
6. Garbage and farm sanitary	3	2	0	0
7. Shrimp harvesting and post-harvest	2	2	0	0
8. Employee and worker welfare	0	3	2	0
9. Social and environmental responsibility	1	3	0	0
10. Data collection, record keeping and traceability	3	0	0	0

2.3.5 Thai COC

In terms of applicability, the results have shown that (Table 4-21):

Thai COC Farm 30 criteria are fully applicable, 76 criteria are highly applicable,

27 criteria are moderately applicable, 7 criteria are slightly

applicable

Applicability score = 54.36%

<u>Table 4-21</u> Applicability score of Thai COC

Thai COC	Number of criteria			
	AS = 10	AS = 0		
COC	30	76	27	7
FARM STANDARD	18	42	11	3
1. Location	2	4	1	0
2. Farm management	3	6	0	0
3. Stocking density	2	1	0	0





4. Feed	2	4	0	0
5. Shrimp health	2	1	0	0
6. Drug and Chemical	3	2	0	0
7. Wastewater and sludge	3	9	1	0
8. Harvest	0	5	1	0
9. Social responsibility	0	5	3	0
10. Training	1	2	0	0
11. Traceability	0	2	5	3
HATCHERY STANDARD	12	34	16	4
1. Location	2	3	0	0
2. Farm management	2	3	0	0
3. Stocking density	2	3	0	0
4. Feed	1	2	2	0
5. Shrimp health	1	4	1	0
6. Drug and Chemical	3	2	0	0
7. Wastewater and sludge	0	9	2	0
8. Harvest	0	2	4	2
9. Social responsibility	1	3	0	0
10. Training	0	3	5	2



CHAPTER 5 Environmental analysis of shrimp supply chains

I. GAP-certified and COC-certified farms

1. Current shrimp farming practices on environmental management

The current shrimp farming practices in terms of environmental management were evaluated by using the questionnaires to interview 232 farms: 81 farms in the Southern region (Gulf of Thailand); 43 farms in the Southern region (Andaman costal zones); 83 farms in the Eastern region and 25 farms in the Central region (Table 5-1). The fractions of small-, medium- and large-scale farms were sampled based on the proportions of different farm sizes in each region as well as the proportions of GAP- and COC-certified farms. In overall, 31% of small-scale farms, 43% of medium-scale farms, and 26% of large-scale farms were sampled in this study. The size of farms located in the South region tended to be larger than those in the Eastern and Central regions. Small-scale farms were mainly in the Eastern and Central regions, with less number of COC-certified farms. In overall, 86% of GAP-certified farms and 14% of COC-certified farms were included in the studied farms.

Table 5-1 Regional variation in farm size and certification levels

Region	Farm size			Certification		
		(%)	Schem	ne (%)		
	Small	Medium	Large	GAP	COC	
	(< 10 rais)	(10-50 rais)	(> 50 rais)	N = 199	N = 33	
Gulf of Thailand (n=81)	28	40	32	88	12	
Andaman (n=43)	5	56	39	88	12	
East (n=83)	45	41	14	82	18	
Central (n=25)	36	40	24	88	12	
TOTAL	31	43	26	86	14	

The key areas for environmental management are identified from the potential environmental impacts as well as taking into account the environmental criteria within the scope of interest among various shrimp certifications. Then they were put into questions to ask the studied farms about their current practices. Details in each question were analysed, as follows.

1.1 Farm layout

According to best management practices in terms of farm's layout, farms should spare some spaces as water-supply as well as sedimentation ponds for water quality



management. In addition, it is recommended to have a separated inlet and outlet to ensure there in no contamination in the water used for culturing ponds. Site entry and buffer zones should also be considered to keep records on visitors and to prevent impacts from/to neighboring farms or other agricultural activities respectively.

The results indicated that COC-certified farms have the better farm layout than GAP-certified farms in general. COC-certified farms all have water-supply ponds and almost all have sedimentation ponds while it is not the case for GAP-certified farm. About 60% of GAP-certified farms do not have sedimentation ponds and 20% do not have water-supply ponds. COC-certified farms have buffer zones and restrict on site access about four and three time higher than GAP-certified farms respectively. Almost all COC-certified farms also have inlet separated from outlet.

Farm layout is well designed especially in large farms to facilitate the farm management system, but not in small farms. The farm layout of large farm is taken into account of: 59 farm.

<u>Table 5-2</u> Farm layout practices

		Farm	s (%)		Comparison			
Farm layout	GA	·P	CO	C	Certification	Farm	Region	
					(GAP)	Size	(Sth. Gulf)	
					COC	(Small)	Andam.	
	Yes	No	Yes	No		Medium	East	
	(%)	(%)	(%)	(%)		Large	Central	
Sedimentation	43	57	94	6	16.9 (3.4,	15.0	NS	
Pond					83)	4.1		
Water-supply	80	20	100	0	-	24.7	NS	
pond						11.9	0.06	
							0.32	
Buffer zone	21	79	58	42	3.3 (1.4,	4.6	NS	
					8.1)	NS		
Site entry	32	68	73	27	3.3 (1.3,	11.3	NS	
					8.3)	2.1		
Separated	63	37	94	6	5.5 (1.1, 28)	19.2	NS	
inlet and						4.2		
outlet								

Note: NS – Not significant



1.2 Location of farm

COC-certified and GAP-certified farms are mainly located near to river or ocean with the proximity to communities, agricultural activities and neighboring shrimp farms. But they are far from mangrove/wetland areas industrial factories and tourist sites. COC-certified farms were mainly converted from rice fields and abandoned lands while GAP-certified farms were used to be rice fields, abandoned land and orchards. The results showed no link between shrimp farms and high-value ecosystems (mangrove, maleuca swamp, and wetland).

Table 5-3 Pond locations

Proximity to other	Farms (%)							
human activities (< 5 km)	G/	Α P	COC					
	Yes (%) No (%)		Yes (%)	No (%)				
Agriculture	67	33	54	46				
Industrial factory	6	94	18	82				
Ocean	54	46	64	36				
River	45	55	46	54				
Mangrove	27	73	36	64				
Wetland	7	93	0	100				
Hotel	2	98	9	91				
Tourist site	6	94	3	97				
Community/village	83	17	79	21				
Shrimp farms	75	25	79	21				

Table 5-4 Prior land-use

Land use prior to shrimp farming	GA	.P	COC		
	Yes (%)	No (%)	Yes (%)	No (%)	
Mangrove	6	94	3	97	
Maleuca swamp	1	99	0	100	
Wetland	4	96	3	97	
Rice field	39	61	52	48	
Garden/Orchard	22	78	6	94	
Abandoned land	29	71	36	64	

1.3 Pond preparation

Practices of GAP-certified and GAP-certified farms are very much similar, by leaving the pond bottom dry with sunlight. Limestone and EM are mainly use to adjust the soil quality of pond bottom. However, COC-certified farms had a greater likelihood of removing pond sediments and turning over the soil layer after a crop (Table 5-5).



On average COC-certified farms had slightly fewer cropping cycles per year than Gap-certified farms (Table 5-6). COC-certified farms seemed resting ponds between crops longer than GAP-certified farms. The stocking density of COC-certified farms was 85 post-larvae (PL)/m² while that of GAP-certified was 80 PL/m². Variation in some pond preparation practices was associated with the region or the farm size.

<u>Table 5-5</u> Pond preparation

Pond		Farm	ıs (%)		Co	mparison	
preparation	G/	Δ P	CC	C	Certification	Farm Size	Region
					(GAP)	(S)	(S)
					COC	M	Α
	Yes	No (%)	Yes	No (%)		L	Е
	(%)		(%)	, ,			С
Drying pond bottom by sun	91	9	91	9	NS	NS	NS
Adding limestone	86	14	94	6	NS	NS	NS 0.20 0.10
Adding 'EM'	66	34	58	42	NS	NS 0.41	NS
Turning over soil	7	93	6	94	NS	NS	NS
Removing	65	35	85	15	3.2 (1.0,10)	NS	0.12
sediments						3.1	0.03
							NS

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

<u>Table 5-6</u> Stocking density, production cycle and resting period between crops

	Farms (A	•	Comparison (Significance)		
	GAP	COC	Certification	Farm Size	Region
Cropping cycles (per year)	2.27	2.02	*	NS	*
Rest period for ponds between crops (weeks)	4.27	5.56	NS	NS	NS
Average stocking density (PL/m2)	80.0	84.5	NS	NS	***

Note: NS - Not significant



1.4 Post-larvae source

Both of COC-certified and GAP-certified farms applied intensive farming system, with similar stocking densities at 80-85 PL/m²; it was observed that the stocking densities varied by region, with the highest averages in the South region. There was no significant difference between COC and GAP farms with respect to from where they sourced post-larvae, what criteria they used for selection or use of different testing procedures. Both of COC-certified and GAP-certified farms mainly outsourced PL from COC-certified or GAP-certified hatcheries. Only 6% of COC-certified and GAP-certified farms produced PL on-site as an integrated farming system. The main criteria of selecting hatcheries were based on the quality of PL and trust (Table 5-7); price was given less priority in choosing the hatcheries compared to the quality and trust. Both COC-certified and GAP-certified farms generally checked the quality of PL at DoF lab's facilities and only a very small fraction preferred to use the private lab services. There were small and rare differences associated with farm size or region.



Table 5-7 Post-larvae source, quality and testing

Post-larvae		Farm	ıs (%)			Comparison	_
	G	AP	COC		Certificati on (GAP)	Farm Size (S) M	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)	COC	L	E C
Sources							
PL from GAP hatchery	59	41	67	33	NS	NS	3.7 6.5 NS
PL from COC hatchery	67	33	79	21	NS	2.6 NS	NS
PL from own hatchery	6	94	6	94	NS	NS	NS
PL from other source	2	98	6	94	-	-	-
Selection criteria							
Quality	88	12	94	6	NS	NS	NS
Price	32	68	24	76	NS	0.34 0.39	NS
Credit	12	88	12	88	NS	NS	NS
Trust	67	23	58	42	NS	NS	NS

1.5 Feed source

Both COC-certified and GAP-certified farms selected feeds based on the quality and price (Table 5-8). GAP-certified farms also considered credit and group purchase for some extents while COC-certified gave less importance to those issues. This might be due to the group forming among GAP-certified farms especially the small-scale farms in order to negotiate with feed manufacturer for better price as a group purchase as well as a credit (i.e. payment can be made after harvesting). The most common brands of pellet feed used by the studied farms were CP (52%), Thai Union (20%), Grobest (19%) Thailux (9%), Lee Pattana (6%) and Lab Inter (6%), respectively. It was observed that some farms used more than one brand. All of COC-certified farms have dedicated a proper storage room for feed. About 90% of GAP-certified farms also have storage room for feed but not in a good condition as COC-certified farms. Feed Conversion Ratio (FCR)



calculation were calculated and recorded by all COC-certified farms, while only 88% of GAP-certified farm did so. It was observed that most of GAP-certified farms especially small-scale farm do not need a storage room for feed as they do not stock feeds.

Table 5-8 Feed selection, storage and documentation

Post-larvae		Farm	ıs (%)		Comparison			
	G	AP	CC	COC		Farm Size	Region	
					on	(S)	(S)	
					(GAP)	M	Α	
					coc	L	E	
							С	
Quality								
testing								
Hatchery	34	66	33	67	NS	NS	NS	
uses								
private lab								
(PCR)								
Hatchery	66	34	82	18	NS	NS	NS	
uses DOF								
Farm uses	6	94	6	94	NS	NS	NS	
private lab								
(PCR)								
Farm uses	7	93	15	85	NS	NS	NS	
DOF								

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

1.6 Energy use and management

In terms of energy use (Table 5-9), the majority of both COC-certified and GAP-certified farm use electricity. Variation in use of diesel and electricity was associated with differences in farm size and location. The main type of aerator used for both COC-certified and GAP-certified farms are paddle-wheel aerator that they did the assembly and maintenance by themselves. About 30% of COC-certified farms tended to use air-jet aerator type, which is approximately 4 times higher than GAP-certified farms. COC-certified farms especially the farms that use electricity all had records, but only 90% of the farms that use diesel had records. About 90% of GAP-certified farms using electivity had records, while only 80% of the farms using diesel had records. Not many farms had energy-saving program, only 12% of COC-certified farms and 7% of GAP-certified farms.



Table 5-9 Energy use indicator

Energy use indicator		Farm	ıs (%)		Co	mparison	
	G/	4P	CC	OC .	Certification	Farm Size	Region
					(GAP)	(S)	(S)
					coc	M	Α
	Yes	No	Yes	No		L	E
	(%)	(%)	(%)	(%)			С
Air-jet aerators	8	92	30	70	3.7	NS	NS
					(1.3,10)		
Use diesel	43	57	30	70	NS	0.26	NS
						0.31	10.9
							NS
Use electricity	73	27	97	3	NS	15.7	NS
						7.8	0.17
							0.26
Have energy saving	7	93	12	78	NS	NS	NS
program							
Record use of diesel	79	21	90	10	NS	NS	NS
(n=95)	00	11	100		NG	NC	NC
Record use of electricity (n=177)	89	11	100	0	NS	NS	NS

1.7 Shrimp health management

There were no major differences in monitoring of shrimp growth and health of COCcertified and GAP-certified farms. Both of COC-certified and GAP-certified farms mainly used the visual inspection in feeding trays for monitoring growth and shrimp's health conditions. Larger farmers are more likely to measure size and weight to monitor the monthly growth. Occasionally, they checked the shrimp's health by diving to pond bottom to check if there are any dead shrimp: 12% and 18% in COC-certified and GAPcertified farms, respectively. Management of diseases at first appeared to be stricter on COC-certified rather than GAP-certified farms, with no significant links with the farm size and location. Chlorine was the most typical disinfectant used by both of COC-certified and GAP-certified farms, otherwise iodine, trichlorfon or sunterex were applied instead. Drugs were applied occasionally, but only the drugs on the positive list by DoF (which all farmers well understood that the prohibited drugs are all banned from the markets). Early harvesting was the case for both COC-certified and GAP-certified farms, which showed that certification was not linked with the crop success or failure. The main causes of early harvesting were: good price, constant growth rate and disease. About 90% of COC-certified farms tended to restrict the site access, while only 53% of Gapcertified farms did that. In overall, Medium-sized farms, in particular, were more likely to use chlorine, harvest early and restrict site access.



Table 5-10 Shrimp health management

		Farm	ıs (%)		C	omparison	
Monitoring and management	G	AP	coc		Certification (GAP) COC	Farm Size (S) M	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		L	E C
Growth monitoring							
Measure size and weight monthly	33	67	52	38	NS	2.6 1.8	NS
Visual iNSpect in feeding trays	89	11	94	6	NS	NS	0.26 NS NS
Health monitoring							
Visual iNSpect in feeding trays	93	7	100	0	NS	NS	NS
Dive to bottom of pond check for deaths	18	82	12	88	NS	NS	NS
Disease check monthly	8	92	18	88	NS	NS	NS
Disease management							
Use chlorine	43	57	57	43	NS	8.9 NS	NS 0.15 NS
Use drugs	27	63	39	61	NS	NS	0.10 NS 0.18
Early harvest	93	7	97	3	NS	6.3 NS	NS
Restrict access	53	47	88	12	NS	28.4 4.7	3.5 NS NS



1.8 Chemical use and storage

Similar chemicals were used by COC-certified and GAP-certified farms: limestone, chlorine and saponin are the main ones (Table 4-10). A few other chemicals farmers said they used were: Iodine (30), Tricophon (22), Potassium permanganate (6), BKC (5), Copper sulphate (2), and Barbasco (1). Farmers understood about the properties of chemicals and allowance to use for shrimp aquaculture activities. But COC-certified farms tended to have better safety information of chemicals, about 2.5 times higher than GAP-certified farms. COC-certified farm gained knowledge about chemicals from DOF (85%), other farmers (77%), products' labels (73%), sale representatives (70%) and other farmers (39%). For GAP-certified farms, they learnt about chemical information from products' label (65%), DOF (61%), sale representative (51%), and other farmers (25%). COC-certified farms had dedicated room for chemical storage and did chemical inventories, 1.4 and 1.9 times higher than GAP-certified farms respectively. COCcertified farms were more than 2 times as likely as GAP-certified farms to train workers on chemical use and safety. More than 80% of both GAP-certified and COC-certified farms had dedicated specifically for chemical preparations. Approximately 60% of them still disposed wastes on-site, though about more than 50% of wastes could be reused and 70% recycled. In overall, disposal of chemical wastes (e.g. containers) of COC and GAP farms was similar with proportion of farms recycling, selling to recyclers and disposal in normal garbage.



Table 5-11 Chemical use and storage

		Farms	(%)		C	omparison	
Use and storage practice	GAI	P	COC		Certification (GAP) COC	Farm Size (S) M	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		L	E C
Common chemicals							
Use chlorine	49	51	61	39	NS	NS	NS 0.18 NS
Use limestone	96	4	100	0	NS	NS	NS
Use saponin	64	36	54	46	NS	NS	0.06 0.16 0.07
Understanding							
Have safety information	18	82	46	54	4.8 (1.7,14)	2.6 2.6	0.21 NS NS



Table 5-11 Chemical use and storage (P15, P16) (cont)

		Farms	5 (%)			Comparison	
Use and storage practice	GA	Р	C	OC	Certification (GAP) COC	Farm Size (S) M	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		L	E C
Understand properties	84	16	97	3	NS	10.5 NS	NS NS 10.1
Information sources							
From product label	65	35	73	27	NS	NS	0.30 NS 0.26
From sale representative	51	49	70	30	NS	NS	0.04 NS 0.03
From other farmers	25	75	39	61	NS	2.8 NS	3.9 NS NS
From DOF	61	39	85	15	NS	3.4 NS	9.6 NS 13
Storage and inventory							
In dedicated room	69	31	94	6	NS	5.4 NS	NS
Inventory	46	54	88	12	6.5 (1.9, 22)	8.9 2.8	NS 0.14 NS
Handling and disposal							
Trained in chemical use and safety	30	70	67	33	4.7 (1.9,12)	NS 2.5	NS



Table 5-11 Chemical use and storage (P15, P16) (cont)

		Farm	ıs (%)						
Use and storage practice	GAP		COC		COC		Certification (GAP) COC	Farm Size (S) M L	Region (S) A E C
Designated facilities for preparations	8	4	16		16		91	9	NS
Disposal on farm	6	3	3	7	58	42	NS		
Disposal normal rubbish	24	76	45	55	NS	3.5 2.7	3.0 NS NS		
Re-use	55	45	67	33	NS	NS	NS 14.5 NS		
Sell to recyclers	70	30	64	36	NS	NS	NS		

1.9 Water and sediment management

Most of COC-certified farms took water from rivers or creeks (55%) or directly from the sea (35%). Several GAP-certified farms used water from irrigation systems (n=17) or underground sources (n=7) whereas no COC-certified farms were found with these practices A small fraction of farms used freshwater to adjust the level of salinity. Most of the farms monitored the water quality in culturing ponds regularly. COC-certified farms were aware of the effluent standards and monitored the effluent quality at least once or twice a year, five to six times as likely as GAP-certified farms. About 90% of COC-certified farms treated wastewater and even reused it, about six times as likely as GAP-certified farms. Effluent practices also vary independently with farm size being better in larger farm. In terms of sediment management, similar practices were found in COC-certified and GAP-certified farms: removing sediment and dry pond bottom and mixing sediment with water to encourage the growth of natural food (algae). But COC-certified farms were 1.5 times as likely to have sedimentation ponds as GAP-certified farms. A few GAP-certified farms (7%) and COC-certified farms (3%) admitted dumping pond sludge into natural creeks.



Table 5-12 Water management

Water		Farm	ıs (%)		Comparison			
management	G	AP	coc		Certification (GAP) COC	Farm Size (S) M	Region (S) A	
	Yes (%)	No (%)	Yes (%)	No (%)		L	E C	
Water inputs								
Use freshwater to adjust salinity	14	86	12	88	NS	N 0.24	5.8 19.2 7.5	
Record water use	25	75	55	45	2.4 (1.1,5.6)	4.1 NS	NS	
Monitor water quality	85	15	94	6	NS	NS	0.14 0.08 NS	
Waste water								
Aware of effluent standards	13	87	61	39	7.4 (2.8,19)	8.8 3.0	NS 9.8 3.5	
Monitor and record effluent quality	13	87	72	28	10.3 (4.1,26)	6.0 NS	NS	
Wastewater treated	33	67	91	9	11.1 (3.1,41)	13.4 4.8	NS	
Reuse waste water	33	67	91	9	12.2 (3.4,44)	8.3 2.3	NS NS 0.30	
Sediment (sludge)								
Remove and dry	19	81	15	85	NS	NS	NS	
Mix with water to grow algae	6	94	0	100	NS	-	-	
Drain into sediment pond	59	41	91	9	6.7 (1.7,26)	4.7 3.6	NS 0.09 NS	
Drain into natural creek	7	93	3	97	NS	NS	NS	



1.10 Biodiversity

Almost half of the COC-certified farms claimed that their farms had increase a number of native animals and plants; much fewer GAP farms made such a claim (Table 5-13). Measures to prevent escape of reared shrimp were universal on COC-certified farms but presented in only half of the GAP-certified farms. Common measures to prevent escapes were having closed systems or filtration.

Table 5-13 Biodiversity impacts

Biodiversity		Farm	ıs (%)			Comparison	
impacts	G/	AP	COC		Certification	Farm Size	Region
					(GAP)	(S)	(S)
					COC	M	Α
	Yes (%)	No (%)	Yes (%)	No (%)		L	E
							С
Native	21	79	42	58	4.0	NS	0.11
animals					(1.6,10)	0.33	0.07
and plants							NS
increased							
Measures	59	41	100	0	***	-	-
to prevent							
escapes							

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

2. Changes in practices as a result of joining certification

2.1 Reasons for joining certification

DOF played a very important role to promote the joining of certification, both for COC and GAP. Most of COC-certified farms (94%) and GAP-certified farms (96%) joined the certification schemes because it was recommended to do so by DOF. For COC-certified farms, shrimp associations were another cited source, which was almost 2 times as likely as GAP-certified farms. Interestingly, CP was the other cited source, which was the case for COC-certified farms and was three times as likely as GAP-certified farms. A few other rarer sources of recommendation were: processing plants, sellers, buyers, middlemen and cooperatives. Some farms mentioned that GAP has become a precondition of selling harvested shrimps to some processing plants and for them that was the main driving force to join GAP. There was no significant difference in average number of sources of recommendation used by GAP-certified and COC-certified farms.



Table 5-14 Recommendations from others

Recommended by	G/	AΡ	COC		Certification (GAP)	Farm Size	Region (S)
	Yes (%)	No (%)	Yes (%)	No (%)	COC	(S) M L	A E C
DOF	96	4	94	6	NS	NS	NS
Shrimp association	19	81	39	61	NS	NS	NS 6.8 NS
СР	5	95	15	85	NS	7.9 4.5	NS

2.2 Preparations before joining (entry)

In general, for all criteria, COC-certified farms had higher levels of compliance than GAP farms prior to certification (Table 5-15). The major differences were with respect to checking and treating wastewater quality, instructions on chemical use and storage, disease control measures and restriction to sites.

The results indicated clearly that entry into both GAP and COC certification schemes, overall, had comparable positive impacts on farming practices against all criteria. GAP-certified farms had in percentage terms slightly larger effect (12%) than COC-certified farms (8.6%) on practices across all criteria.



<u>Table 5-15</u> Farm management practices before entry and changes after entry to certification scheme.

Farm		Prior to	o entry	Changed af	ter entry	
management	G/	ĄΡ	СО	С	GAP	COC
practices	Yes (%)	No (%)	Yes (%)	No (%)		
Check post-	88	12	100	0	8	6
larvae quality						
Check intake	64	36	76	24	11	6
water quality						
Pre-treat	78	22	97	3	12	9
incoming						
water						
Check water	87	13	100	0	9	6
quality						
during						
culture						
Check	32	68	85	15	11	15
wastewater						
quality						
Treat	32	68	85	15	13	6
wastewater						
Treat sludge	79	21	91	9	11	15
INStructioNS	66	34	91	9	30	18
on chemical						
use						
Dedicated	78	22	91	9	7	12
chemical						
storage						
Use high	98	2	100	0	7	6
quality feed						
Dedicated	89	11	100	0	8	6
food storage						
Maintain	84	16	97	3	14	9
food safety						
standards				_	_	_
Check growth	94	6	100	0	6	6
and health				_		_
Measures to	71	29	100	0	15	6
control						
disease						
Measures for	79	21	100	0	15	6
dead shrimp				_		
Restrict	51	49	97	3	16	6
access to						
farm areas						



Several other large changes after joining the GAP/COC certification schemes were noted (Table 5-16). The largest changes were falls in complaints about environmental impacts – an extraordinary 75% and 88% for GAP and COC certification schemes, respectively. Other major changes were related to chemical use and ecosystems issues: reductions in chemical use (59/36%), reduction in chemical use (56/36%), no chemical residues in harvest shrimps (37/18%), and improved natural water quality (23/30%). While both schemes contributed to significant improvements in chemical/antibiotic use those associated with GAP certification were larger than with COC. This indicated an upgrade of farming system in terms of chemical/antibiotic reduction.

Certification clearly had a major impact on how shrimp farmer owners perceived complaints about the environmental impacts of shrimp farms. This fits with very positive self-assessments of local impacts noted earlier. Also, the farmers have realized by themselves to be able to provide a proof of using less chemicals and antibiotics with processing plants.

Table 5-16 Other changes noted following certification

Other changes	G,	AP	CO	С	Comparison of impacts of certification
	Yes	No	Yes	No	(GAP)
	(%)	(%)	(%)	(%)	COC
Good quality	23	67	15	85	NS
post-larvae					
No aquatic	19	81	12	88	NS
animals in					
water supply					
Use less water	9	91	3	97	NS
Discharge less	8	92	9	91	NS
waste water					
Comply with	10	90	21	79	NS
effluent					
standard					
Improved	23	77	30	70	NS
natural water					
quality					
Reduced use of	56	44	36	64	0.44 (0.21,0.95)
chemicals					
Reduced use of	59	41	36	64	0.40 (0.19,0.86)
antibiotics					
No chemical	51	49	36	64	NS
residues					
No	37	63	18	92	0.38 (0.15,0.95)
contamination					



problems					
Less infection	26	74	12	88	NS
and disease					
No complaints	74	26	88	12	NS
about					
environment					

Note: NS – Not significant

2.3 Documentation

Farmers have learnt about documentation systems during the preparation stage. It was a key lesson for them, as they claimed that they did not think such documents would be required before. Before entry, for all documentation-related criteria COC farms had higher levels of compliance than GAP farms prior to certification. For many criteria COC was or approached 100% coverage: land documents, record of stocking density, record of feed (including FCR) and energy use. The largest differences were in recording water use and wastewater quality: GAP farms did not record those data before.

Entry into GAP certification schemes had impacts on all documentation practices investigated whereas entry into COC was associated with recording wastewater quality and farm manuals. GAP had in percentage terms slightly larger effect (9.5%) than COC (7.5%) on practices across all criteria. It was also observed that the farmers did not have a clear understanding about the farm manual. Different farms showed different structure and contents in the farm manual. Some though the booklets from feed manufactures were as equivalent to the farm manual. Many COC farms were supported by DOF to develop their farm manual, without being involved in the write-up.

<u>Table 5-17</u> Documentation practices before entry to certification scheme and changes after entry

Documentation		Pr	Changed after certification			
	GAP		СО	С	GAP	COC
	Yes	No	Yes	No		
	(%)	(%)	(%)	(%)		
Farm manual	26	74	42***	58	21	48
Land document	96	4	100	0	4	0
Record of stocking levels	92	8	100	0	7	0
Record use of feed	89	11	100	0	8	0
Calculate FCR	88	12	100	0	7	0
Record water	19	81	58	42	12	3



use						
Record water	76	34	97	3	8	0
quality						
Record	7	93	46	54	10	21
wastewater						
quality						
Record energy	75	25	100	0	11	3
use						
Record	3	97	15	85	7	0
animal/plants						

2.4 Perceptions and attitudes towards common criteria in standards

Almost all farmers (more than 88% in all items) agreed with the principles of GAP and COC certification. However, farmers were virtually unanimous in support for common criteria used in standards especially on the energy use and limited stocking density aspect. Most of the farmers inclined to believe that an excess oxygen level should be provided at all times as insufficient oxygen could lead to negative consequences to water quality as well as shrimp health. Disagreement about setting stocking density limits were mainly related to the productivity and especially to their profit. Additional reasons given included that suitable density depends on the culture technique applied, the experiences in field (n=5) and because otherwise farmers may not break even (n=7).

Many practices as suggested by criteria are already done by majority of farmers especially on these following issues: location of farms far from potential pollution sources (99%), chemical management (98%), waste management (97%), sediment management (94%), and energy use reduction (93%).

Among those which are not farmers found the set of criteria related to waste water (reducing volumes, checking and treating), limited stocking density among the hardest to comply with, followed by the declaration of environmental policy in farm manual. Some (10%) mentioned about the farm located outside mangroves is another hardest to comply with – this could be implied that some farms are still located in mangrove areas.



<u>Table 5-18</u> Perceptions, practices and attitudes towards common environmental criteria in standards

Perceptions, practices and	Agree with	Already	Easy	Hard	Impossible
attitudes	criteria	do (%)	to do (%)	to do	(%)
	(%)			(%)	
Environmental policy (in farm	99	60	23	14	3
manual)					
Farm far from pollution sources	99	99		1	
Farm not in mangrove	97	85	2	10	3
Biodiversity conservation	99	72	24	3	1
Stocking density limits	88	69	5	22	4
Chemical management	99	98	2	1	
Reduce wastewater volume	98	55	12	28	5
Treat wastewater	97	46	8	38	8
Check quality of wastewater	96	25	25	39	11
Comply with effluent standard	97	44	18	33	5
Reduce energy use	Missing	93	3	3	2
Manage sediments	99	94	3	2	1
Manage wastes	100	97	2	1	
Documentation	100	79	13	6	1
Traceability	100	81	15	4	1

2.5 Influential sources

Virtually all farmers got information about GAP and COC information from DOF (Table 5-19). Other important sources, especially for COC farms, were shrimp growers' associations and CP officials. We also asked farmers about factors that made it more difficult or easier to obtain certification. While a few farmers complained about slowness of officials and technical difficulties (Table 5-19). There was no evidence of corruption or preferential treatment. The only factor mentioned to make it easier to obtain certification was having friends or relatives in DOF.

Table 5-19 Sources of information and knowledge

Sources of information	Before a	pplying	To be able to meet standards		
	GAP	COC	GAP	COC	
	(%)	(%)	(%)	(%)	
Other shrimp farmers already having certification	4	15	4	12	
Shrimp growers' association	14	30	13	30	
DOF Officials	98	97	98	97	
CP Officials	2	15	2	15	
Processing plants	2	3	1	3	



<u>Table 5-20</u> Factors that make achieving standards in certification schemes more difficult or easier

Factors making it more difficult/easier	GAP	COC
	(%)	(%)
Factors making it more difficult		
Slowness or lack of responsiveness of officials	4	12
Difficulties finding out technical requirements	4	0
Corruption	0	0
Factors making it easier		
Friends or relatives in DOF	1	3
Friends or relatives in government	0	0
Friend or relative as village headmen	0	0

II. ACC-certified farms

The in-depth interviews were conducted to 10 ACC-certified farms (83% of the total certified farm at that point of time). The current shrimp farming practices on environmental management and changes in practices as a result of joining certification

(1) Tawee farm, Surat Thani

Reason to join ACC The first experience on certification was from Dr. Dominique (AquaStarEU) who came with Seafresh (a packer) and the auditors from M&S and Tesco to visit the farm to evaluate if the farm could meet their requirements. The preliminary audit results showed that the farm already complied with 70% of the criteria at that point of time. The non-compliance criteria were mainly related to documents (e.g. payment slips, written bio-security plan, water quality test report). The lesson he learnt was about the documentation systems. The farm owner would like to prepare himself to be able to respond to market requirements.

Support for implementation Thai Union Frozen Products (UFP) was important in getting the certification process rolling. They hosted a meeting of 10 large farms with potential for ACC certification. Not many in the end opted to proceed, but TWF was the only one due mainly to a little effort and time required for the farm improvement. Attached to CP as their client for shrimp feed, the CP certified farms in Chumporn allowed the farmer to visit the farm and shared their experience on the audit. The farmer found the CP farm visit most helpful to prepare the audit.

Opinions about certification principles and criteria The farm owner argued that ACC certification had made little difference to his farm or business management practices apart from some additional book-keeping which they had to do to satisfy auditors. He



believes that with 20 years experience including some ponds in their original locations that they already "know how to do sustainable shrimp farming; if they didn't they would not still be here". He mentioned that some criteria were not practical such as the level of nitrate that is linked to the level of pH thus the level of nitrate alone should not be the criterion, the requirement of not working after 5 pm is impossible as shrimp farm works can happen after 5 pm (such as checking aerators, guarding the farm, monitoring water quality, etc.).

Expectation and real experiences

- After being certified, contract farming was arranged with UFP but the order was only a small amount. On the ACC website TWF's link is to UFP's website even-though the two companies have no formal agreement Mr. Thamarat repeatedly said "this was not serious", but it was clear that he was not happy about the treatment by UFP.
- ACC certification costs money and has no benefits when it comes to price. Direct cost for the certification procedure is around 100,000 Baht for the certification procedure.
- The owner was disappointed at the lack of price premium and is seriously considering discontinuing certification. Another point of concern leading to the decision to discontinue the certification is related to the added cost of inputting the data on the online traceability systems of ACC (one dollar per page).
- ACC Certification did not help open new market channels as expected. He never negotiates the price with processors, as his main aim is to get the order so as to maintain the sale volume since he has a high production volume.
- In any case, he noted, external clients like Mark & Spencer or Tesco-Lotus send their own auditors they do not rely on certification schemes like ACC.

Suggestions to other farms on ACC Two main factors should be considered for other farm to join or not to join ACC: the current status of compliance to the certification (i.e. assessment of cost and time required for the full compliance) and the purpose of certification implementation (i.e. the requirement from your frequent buyers). The only advantage from being certified, he will extend to other farms, is the increased market opportunities but not the higher price as expected.

Observations and comments (by researchers) Tawee farm 7 was clearly well organized and thus suitable to bring groups to visit (Photos below). There were maps and signs on walls, boots to put on when you go in the field (but the owner did not put them on), and sheets to fill-in as visitors. Certification encourages linking of elements of supply chain, but because food processing firms are much larger than even relatively big shrimp farming operations, they have much more power in setting terms of business relationships.



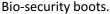


Money and time rules where shrimp change hands.



Harvesting a pond on Farm 7.







Clean, organized, sorting and packing space.

Figure 5-1: Photo taken at Tawee farm during the harvesting activities

(2) Suksun farm, Trung (ACC-certified farm)

Reason to join ACC The farm was motivated to join ACC because the buyer (Good Luck processing plant) would like to make their shrimp easier to sell. The farm already had GAP for 6-7 years. According to owner, GAP certification has no meaning to overseas buyers.

Support for implementation Good Luck sent expert to help. Their advice was crucial to meeting standards. Cost of certification was around 70,000 Baht (owner was unsure of



exact figure as this was taken care-of by someone else, plus the Good Luck processing plant mainly contributed to the cost of certification). The farmer greatly values his previous working experience with CP and experience sharing from other shrimp farmers that he learnt from reading the shrimp magazines and attending the shrimp meetings.

Opinions about certification principles and criteria It describes practices already normal (e.g. no use of banned chemicals) and already monitored by DOF

Expectation and real experiences

- Most important changes to management practices in past 10 years as a result of joining ACC have been: lower densities, more stringent disease control, especially when stocking; and need to manage more information about demands and prices for different sizes of shrimp. In general, ACC has improved the farm in terms of farm management practices —to be more systematic and biosecure.
- ACC certification has no impact on prices or market access. Other firms to whom he sells are not interested in certification, just lowest price possible and GAP is accepted as the pre-requisite.
- Complained bitterly that contracts with farmers are not honoured. Buyers say they will give a particular price and then use trivial criteria to claim stock is not of sufficient quality and then drop the price. The farmer has been in doubt as there is no visit from the ACC-certified processing plant that should need the shrimp raw materials from certified farms to collect the two stars. Sometimes the farm found out that the Good Luck Company bought a high volume at low price and further sold the shrimps bought from his farm to another processing plant.
- The farm will not continue with ACC certification, mainly because there is no demand.

Suggestions to other farms on ACC The farmer would recommend other farms having GAP as the minimum standard as general people will not be aware of the environmental coNSequences of their farm operatioNS. In his personal opinion, ACC is not necessary to adopt as you can choose the processors who do not require ACC. His colleague suggested the survival strategy in shrimp business could be to directly contact with processing plant so that the farming operatioNS can be planned to produce the required size. For the trading with oversea buyers, the government should be the coordinator between stakeholders along the whole supply chain to eNSure the fair distribution of benefits.

Observations and comments (from researchers)

- Farm consists of 10 clusters of ponds, 3 in Satun and 7 in Trang. Altogether there are about 200 ponds of which 30-35 ponds in 4 farms in Trang are ACC certified. A "farm" may include ponds in several different locations. Or, a "farm" may include subsets of ponds owned by different people in different places. Some of the ponds in Suksun farm are part of a group of a "farm" compiled by the brokering (or food processing firm?) "Good Luck".



- Buyers of shrimp have a key role in the ACC certification process. They are the ones asking, persuading and showing farmers how to get certification. But there may not be follow-on benefits for farmers. It seems buyers do not yet need "more stars" to sell shrimp. Overseas buyers are not using system (yet) to choose suppliers (at least from what farmers know).

(3) Samonrat Farm, Krabi

Reason to join ACC Certification process began when Wallmart contacted several agencies at the Mahachai central auction market for ACC-certified shrimps. The broker "Jae Rak" (an agency) arranged a meeting for shrimp growers. At that event Walmart made a clear promise that ACC certified products would fetch a better price.

Support for implementation "Jae Rak" brought in a consultant to assist him in preparing for certification and "paid" for it out of a next crop sale. "Jae Rak" also updates paper records onto website for their farm through the "Shrimp Network" service (a private traceability system).

Opinions about certification principles and criteria His farm has been routinely monitored by DoF (once every 15 days). One advantage of this is that he could get documentation for special order. It also meant that some of the procedures for ACC were already regular practice.

Expectation and real experiences

- The premium price for ACC-certified farms does not happen yet. There was no interest from processors to buy ACC-certified shrimps, e.g. Thai Royal Frozen Company Ltd. visited the farm once but nothing happened after that.
- Implementation of ACC certification had impact on practices in at least two ways: overall cleanliness and orderliness, and improvements of health and safety of workers.
- Processors fail to honor promises on prices. Thus, the only way to survive has been to get more and more efficient, for example, by finding ways to reduce production costs (i.e. lowering FCR).
- The farmer is looking forward: "if they use ACC, we will extend; if not, why bother".
- The farmer said that Department of Fisheries is helpful in terms of documentation (e.g. health certification, movement document) but for marketing activities Department of Export Promotion should take the lead. The farmer also wanted to know "why the price of Thai shrimp is lower than others".

Suggestions to other farms on ACC The farmer's advice to other farms was: "Before I would recommend ACC must guarantee a price premium; that has not happened yet."

Observations and comments (from researchers) The Thai farmers believe they are good at the technical aspects of shrimp farming, but recognize that they have limitations



as individuals and as a stakeholder group when it comes to marketing. They believe that processors have the lowest risk but get the highest benefit. In contrast, a high risk but a low return occurs at the farm level. Failure to honour contracts appears to be a serious issue. However, some processing plants in Songkla (based on the results from previous project) said that farms could not deliver the product at a specific size as promised so they are not keen to have contract farming.

(4) TSM farm, Ranong

Reason to join ACC The farm was concerned that US is his main market and it is likely that US clients will require ACC-certified shrimps.

Support for implementation The farm could join ACC without difficulties as the farm was already certified COC. To upgrade from COC to ACC, the farm had to improve only workers' welfare particularly to drinking water, toilets, and farm environment including signs. The main difficulty is related to the land title as his farm is a rented land area owned by three people on the land that is not legally allowed to be rented.

Expectation and real experiences The farm expected that processors would prefer to buy their shrimps. But in reality, processors will require particular sizes and cannot take all harvest shrimps.

Suggestions to other farms on ACC Food safety is the main element of farming shrimp. Producers have to be able to comply with the international standards requested from overseas buyers.

(5) Sawee farm, Chumporn

Reason to join ACC The farm decided to join ACC for marketing opportunities especially in overseas countries. The preliminary study of ACC gave an idea on the requirements of environmental protection and traceability systems. The farm had to provide a test report from an ACC/ISO 14025-certified laboratory, while the laboratory of Department of Fisheries is not certified under this requirement. The farm then contacted the local university for wastewater and effluent quality tests. Another issue for major correction was related to the fixing of draining facilities to solve odour problems complained by the local communities from poor draining system. The documentation system was not a problem, as the farm has kept recording before. The traceability form provided made it easy to record the required data.

Support for implementation The farm has adopted the probitoic farming together with safety, health and environmental management systems. The farm was encouraged and convinced by Department of Fisheries to join GAP and COC. Being certified GAP and COC helped the farm to comply with ACC easily.



Opinions about certification principles and criteria The major improvement for joining ACC was the removal of labour residence from culturing zones to outside areas and facilities for workers (i.e. toilets and hand washing basin) were additionally provided. The farm is very concerned with the environmental impacts to nearby communities and surrounding as it is located behind the Mu Koh Chumporn National Park. The investment was mainly linked to the labour residence and improvement of farm's landscape. The farm also engaged in community activities to have a good relation with them. For other farms, it is most important to consider the production capacity and the capacity of farm to adopt the certification.

Expectation and real experiences The farm primarily expected that certification would help securing the selling price, as well as to give a green image. After joining the certification, the farm realized that certification assisted in improving the farming practices to be more responsible and sustainable. More importantly, it is a tool to demonstrate the quality assurance to overseas buyers. But there was no impact on the selling price, which was disappointing. The farm disagreed with the overhead fee as it was unnecessary to push this cost to producers. However, the overseas certification provided marketing opportunities. The farm worried about the required data on the traceability system, as buyer could estimate their production cost.

(6) Burapa Farm, Phanggha

Reason to join ACC A local processor whose clients are mainly in the US asked the farm to join ACC.

Support for implementation A local processor would like to upgrade their supply chain, after being certified 2 starts from the processing plant and hatchery level. Thus, the processor offered technical and financial supports to the farm to adopt ACC so that the processor will have another star.

Opinions about certification principles and criteria The main farm improvements to comply with ACC were the construction of feed-storage room, dams of diesel-storage areas to prevent oil spill, and labor residence including toilets.

Expectation and real experiences The farm expected to get a premium price, but the selling price was not much different from non-certified shrimps. However, ACC certifications provided more marketing channels as the farms could sell their shrimps to other processors as well.

Suggestions to other farms on ACC Joining ACC could be very difficult especially for small-scale farms. Not only the costs associated with farm improvement and certification procedure, but there will also be the annual fee on top of that. English knowledge will certainly be their problem as well.



(7) IT5 Farm, Phanggha

Reason to join ACC The company considered that certification would become the future trend for shrimp marketing and trading. To ensure the long-term sustainability in business, it is essential to join overseas certification like ACC or GLOBALG.A.P. The farmer has planned that all of his farm must be certified GAP and at least 1 farm for COC. For overseas certifications, there should also be at least 1 farm certified ACC and GLOBALG.A.P.

Support for implementation The farm has arranged a contract farming system with a processor before. As a result, the processor then extended the requirement that the farm must be certified ACC. To be able to comply with ACC, the processor offered some financial assistance to the farm.

Opinions about certification principles and criteria The easiest part was the record keeping as the farm has already established a data recording system, but the records are in paper not in a computerized system. The requirement of record keeping is useful for farm manger and workers to keep recording about farming practices for better management systems and to facilitate the information to convince investors to join the business. The most difficult part was the requirement to have wastewater treatment as the farm's areas are limited and the cost of land nearby the farm is rather high. At that time, the profit gained was rather low so the farm did not want to invest more. As a result, some culturing ponds were converted to sedimentation ponds to minimize the increased production cost. With respect to the requirement of local labor, the farm did not hire local labor because of stealing problem. To join ACC, local labor was introduced in some positions.

Expectation and real experiences The farm expected that ACC certification would help securing the shrimp marketing through a contract farming system to specify the selling price. The joining of ACC helped distinguish the farm in terms of farm management system and food safety control as compared to non-certified farms. Most importantly, the farm personnel learnt how to upgrade the standard level of farm to join the certification. They also realized that labor residence and facilities were also improved through joining the certification. The farm only got a premium price for small- and medium-sized shrimps but not for large-sized shrimps.

Suggestions to other farms on ACC Joining ACC is good as there is a clear agreement on selling price through a contract farming system, which is different from joining COC. It is great to see that certification will be a marketing tool to facilitate the trading between farms and processors by using a contract farming system. To stay in the shrimp business, joining certifications is very important.



(8) Karnsiri farm, Satoon

Reason to join ACC The main reasons for farm to join ACC was because the farm wanted to demonstrate and provide the information to buyers on the quality assurance systems on food safety and farming practices.

Support for implementation A local processor informed the farm that there was a request for farms to join ACC from overseas clients. As the farm has a long-term relationship with the processor, so the farm decided to implement ACC to support the processor.

Opinions about certification principles and criteria ACC is an advanced certification scheme. If the farms do not have a good management system before, then joining ACC can be very difficult. The farm spent a year to improve the farm management systems in terms of hygiene management, labor residence and facility, waste management system, chemical inventory, wastewater/effluent quality checking and data recording system. Being certified COC, the farm could easily comply with the requirements of ACC as several criteria are overlapping.

Expectation and real experiences The farm expected that joining a certification would guarantee the quality of shrimps especially on food safety, leading to an increased selling price. But the price was the same for certified and non-certified shrimps. The farm was less motivated to maintain the certification as no impacts on selling price.

Suggestions to other farms on ACC It is not recommended to join ACC, as there was **no impacts on selling price**. Joining ACC was rather complicated because of the requirements of documents and laboratory tests. Having a certification is beneficial only in terms of quality assurance.

(9) Sinsad Farm, Chanthaburi

Reason to join ACC The demand of ACC-certified shrimps from processor was the decision factor for farm to join the certification.

Opinions about certification principles and criteria The farm was previously certified COC and thus farming management systems are continuously improving. To join ACC, the farm had to improve the wastewater treatment facilities and detailed documentation system, including labor. A national certification scheme likes COC should be acceptable at international level. If private certifications are allowed to apply, then there is a risk to have another private certification applied to shrimp aquaculture in the future.



Expectation and real experiences The selling price of ACC-certified shrimps was agreed through a contract farming system, which was very useful for farms to ensure that they would not get lost and the price fluctuation would have no impacts for them.

Suggestions to other farms on ACC The main barrier for farms to join ACC is the documentation systems. Most of the farms in Thailand do not have a recording "system" as required. The implementation of COC provided a good start of compliance level to ease the joining of ACC, whereas GAP-certified farms had to improve more to join ACC. The farm always dealt with processors via contract farming to reduce the risk on selling price that are fluctuating. For small-scale farms, the cost associated with farm improvement (i.e. wastewater treatment facilities and documentation systems) could be problematic.

(10) Suksun Farm, Chanthaburi

Reason to join ACC Joining ACC has broadened the farms in terms of marketing opportunities. The farm came known to several processor who seek for ACC-certified farms. This is an advantage for the farms that have potential to comply with the requirements of ACC.

Opinions about certification principles and criteria The main improvements to comply with ACC were the registration of workers and data recording systems. The farm was convinced that a good data recording system was very useful for better farming practices. The farmer was rather concerned if there would be a requirement for another private certification from buyers.

Expectation and real experiences The farm expected that the processors would give a premium price for ACC-certified shrimps but it was not the case. Joining ACC only gave the marketing opportunities for farms to be the first choice for processor to source their shrimps from.

Suggestions to other farms on ACC The farms should prepare the required documents and records to be able to comply with ACC. Technical supports will be useful for the farms. However, private certifications have posed a threat to small-scale farms as they will not be able to adjust their farming systems to be in compliance



III. Organic-certified farms

(1) Sureerath farm, Chanthaburi (Organic-certified farm by Naturland)

Reason to join Organic The farm used to be a main client of CP for chemicals and feeds. After the problem of antibiotic residues, the farmer realized that using of chemicals did not help preventing the diseases. Since then, the farm has lowered rearing densities and progressively reduced use and then eliminated chemicals in pond. At the same time, they had been actively looking for alternative marketing channels for high price-high quality shrimp products in overseas markets. GTZ was suggested by DoF to pursue his farm as a demonstration project for organic systems. The farm explored via internet different options for third party certification. In the end, the farm decided to go with Naturland because they believe it had the best reputation. The farm has also applied for "Bio-Swiss" certification and believes they will be granted it soon. This scheme uses "Naturland" standards but is more familiar to Swiss consumers.

Support for implementation The farm tried out their guidelines on a few ponds for one year before registering, with technical assistance from Naturland and GTZ.

Opinions about certification principles and criteria Naturland's standards are a set of principles with a few core rules; detailed recommendations on technologies and practices are negotiated between the technical support staff and the farm. Several examples were given where initial rules were adjusted. For example, the farm successfully argued that aeration should be allowed as needed. They also successfully negotiated for a doubling of the maximum allowable density in terms of yield from 800 kg to 1,600 kg per pond and counting "water treatment areas" in calculating densities. Auditors make two visits a year, one un-announced.

The most significant and challenging change to practices for Sureerat Farm to meet certification requirements were with feeds. They had to move to making their own feeds (with the Thai Union Feed Mill Company, Samut Sakorn) as no suitable supplier of organic feeds was available. With no preservatives allowed their feed has a shelf-life of 10 days. As a consequence they must make batches of feed every week. Their current formula requires importation of organic wheat from Turkey. Feed includes high quality fish meal. They must also adhere to the overall 20% limit on fish meal inputs, and 25% protein limit, set by Naturland. They do not use soybean as it usually GMO (As an aside, we learnt that the President has strong reservations about soy bean. He believes that they are responsible for "social ills" in Thailand like the rise in "feminized" men.)

Expectation and real experiences

- When originally sought, certification with Naturland had expected to facilitate access to markets in Germany. This did not work out acceptably for the farm because German



consumers appear to be only willing to pay a price premium of 20-30% for organic products based on their experiences with vegetables, whereas the farm believes that for animal aquaculture products the mark-up should be at least 60-80% to cover the various component costs.

- Third-party certification has opened channels to premium price market in Switzerland.
- The farmer and his son believe there are three areas where Thai policy most needs to change to assist organic shrimp farming: (1) lower interest loans; (2) ensuring certification is 3rd party; (3) ensuring core standards are not relaxed e.g. on use of chemicals; (4) subsidies or removing unfair "charging rates", for example, with respect to electricity where they must pay a "demand charge" like a normal factory in a way that does not take into account the seasonal cropping pattern of shrimp farming.

Suggestions to other farms on Organic The farmer was invited to shrimp meetings to promote organic farming to other shrimp farmers. But so far others have not committed, in part, because of difficulties in getting appropriate feed. He told us there is a group of farmers in Trang that have expressed interest in farming organic shrimp — there are another four farms (Chanthaburi, Samut Prakarn, Trang and Krabi) are trying to convert into organic.

Observations and comments (from researchers)

- What is "organic"? Thai farmers think that organic means no chemical use; anything beyond that is not in their mentality as yet.
- The longer-term business strategy of Sureerat farms seems obvious: get out of farming and become a feed producer and food processor. They clearly have interests in creating a second generation of organic farmers to whom they could supply feed and from whom they could buy shrimp to process, package and export.
- His son has an MBA degree so he now takes care of on marketing and dealing with overseas clients. They go to food fairs they got the support from DoF as well as GTZ (no where mentioned that Sureerat farm was a demonstration project of organic shrimp farm initiated by GTZ). They visit supermarkets in Europe. As a consequence their knowledge about retailers is much stronger and they can conceive of "skipping" agents or food processors and making contact directly with retailers.

In summary, GTZ is the key institution who tried to promote organic shrimp production in Thailand with technical assistance from Naturland (a certifier). The farmer joined the certification in order to search for an alternative market with the expectation of marketing opportunity for a premium market and a premium price. The main difficulty in implementing organic certification is related to the organic feed. The requirement of organic feed lead to the importing or organic feed ingredients and the production cost of feed become higher. However, the market demand for organic shrimp is not growing much and consumers (in Germany) appear to be willing to pay a price premium of 20-30% only while the farmer believes that it should be 60-80%.



CHAPTER 6 Social analysis of shrimp supply chains

1. Current social practices

1.1 Workers

COC farms were more likely to have at least one employee and more likely to employ foreign workers than GAP farms (Table 5-1). Just under a fifth of recognized employed workers overall were foreign nationals, broken down as follows: Burmese (10.8%), Laotian (4.2%) and Khmer (3.4%). Only one farm (GAP) admitted to having under-age labor. COC and GAP farms, on average, have similar numbers of workers after adjustment for size of farm and region. Almost all shrimp farm employees were men (96%).

Several farm owners interviewed said they preferred to hire non-local labor as this reduced problems of theft. ACC certification requires some local employment so owners abide but only for some non-core positions. Another ACC farm also admitted partial compliance: "If follow ACC scheme then must employ some workers legally. But for others – this is hard work, Thai's won't do it; this is the truth – we cannot to pay full wages because the profits from growing shrimp are too low."

Table 6-1 Workers

	G/	Λ P	COC		Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	N0 (%)	Yes (%)	No (%)		M L	E C
Employ workers	72	8	94	6	5.2 (1.0, 27)	12.6 NS	0.28 NS NS
Employ foreign workers	11	89	30	70	2.9 (1.1, 7.6)	NS	NS

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

1.2 Worker relations and benefits

Labor was more formally organized on COC than GAP farms. COC farms were 3.7 times more likely to issue contracts and 8 times more likely to provide salary slips or similar documentation (Table 5-2). COC farms were 4 times more likely to have appointed

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worker representative and 7 times more likely to have regular meetings with workers (Table 6-2).

Workers received similar pay on average on GAP and COC farms (Table 6-2). Women were paid less than men: about 32% less on GAP farms and about 15% less on COC farms (Table 6-2). In addition to regular salary almost all farms give workers a commission on the harvest. For example on one typical GAP farm interviewed workers were paid between 200-300 baht a day and received a further bonus of 1-2 baht / kilogram on each harvest. Farmers with special skills, like mechanics or drivers may earn 300-500 Baht a day. As a shrimp club official told us: "effective shrimp farm businesses usually don't take advantage of their workers; they offer incentives."

There were no differences in leave benefits between COC and GAP farms (Table 6-2). The most common pattern was to allow workers four days leave per month. Although owners claimed certification schemes benefited workers on GAP (72%) and COC (94%) farms specific benefits attributable to joining were acknowledged in only a small fraction of farms (Table 6-2). Owners of ACC farms claimed that certification resulted in improved worker benefits.

In general workers were not aware of the certification status of the farm. Those that do know about certification knew only that DOF checks farms but rarely understood any other details of certification. Workers say they just follow instructions of their bosses and did not have certification schemes explained to them. This may be a constraint on achieving better practices and higher compliance.



<u>Table 6-2</u> Labor relations - contracts and representation

Labor relations	G <i>A</i> (n=1		(n=		Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		M L	E C
Employee contracts	10	90	33	67	3.7 (1.2, 11)	14.6 4.1	NS
Follow minimum wage guide	77	23	90	10	NS	NS	NS
Salary slip issued	38	62	68	32	7.9 (2.1,30)	13.6 2.5	NS 0.15 10.4
Appointed worker representative	23	77	58	42	3.9 (1.5,10)	5.2 3.2	NS
Regular meetings with workers	59	41	90	10	6.9 (1.8,26)	3.2 NS	NS 0.18 NS

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

<u>Table 6-3</u> Salary levels and leave

Monthly	Farms (Adjus	sted means)	Compai	ance)	
	GAP	coc	Certification	Farm Size	Region
Salaries of women (n=27 farms)	3,299	4,120	NS	**	*
Salaries of men (n=172)	4,873	4,920	NS	NS	***
Days of leave (n=147)	2.87	3.22	NS	NS	NS

Note: NS - Not significant



Table 6-4 Types of realized benefits of certification for workers

	GAP	COC
	n=144	N=31
Meeting minimum wages according	3	3
to law		
Clearer contracts	3	0
Improved accommodation	7	10
Better health care	6	3
Better workplace safety	6	3
Better employee-owner relationships	4	0
Less complaints from local	4	0
community		

1.3 Workplace conditions

COC farms had substantially better practices than GAP farms when it comes to safety against all criteria (Table 6-5). Even so some practices were still relatively rare: provision of first aid training and supplying protective clothing (Table 6-5). COC farms were four times as likely to provide insurance for workers than GAP farms, but only a quarter of farms did so (Table 6-5).

COC farms, however, were more likely to have recorded worker accidents (Table 6-5). Of 7 COC farms reporting such accidents on 3 involved hospitalization and death. Of 9 GAP farms 1 involved hospitalization and death.

Health and safety practices on farms and hatcheries vary widely. While many farms are improving their handling and storage practices others have not changed practices and still fail to meet several criteria even after achieving basic certification. Handling chemicals, in particular, is still an issue, for example, in not providing gloves: "Don't have any. Just put in a container and scatter. The boss didn't give us any. When we add chemicals we just do it; if they are infected, we are."

ACC certification had even stronger repercussions for worker relations and conditions. "Westerners and Thai's don't think the same way about workers. About workers, we need to change a lot. Cleanliness, safety – they are strict." (ACC Farm Owner).



Table 6-5 Health and safety

		AP 143)		OC :31)	Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		M L	E C
Safety							
First aid equipment	88	12	100	0	*	-	-
Protective clothing	3	97	16	84	8.0 (1.4,46)	NS	NS
First aid training	6	94	19	81	5.8 (1.5,23)	NS	NS
Eye wash station	16	84	48	52	4.8 (1.8,13)	NS	NS
Safe chemical use training	68	32	97	3	10.9 (1.4,87)	3.9 NS	NS
Health care							
Pay for treatment	76	24	90	10	NS	NS	Ns 0.15 NS
Insurance	6	94	26	74	4.0 (1.1,15)	NS 5.4	NS
Health & safety record							
Work accidents	6	94	23	77	7.7 (2.0,30)	NS	NS

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

1.4 Living conditions

Most farms provide accommodation and basic facilities for their workers (Table 6-6). More than half provide meals. COC farms were more likely than GAP farms to have washbasins and allow workers to use on-farm car (Table 6-6). About half the farms allowed partners or children to stay in on-site accommodation (Table 6-6). According to workers some small farms still need to improve accommodation and provide toilet facilities. Farms entering ACC certification schemes often must improve conditions and do so.

We asked farm owners (n=174) about four kinds of social problems among workers in the past year (S7). All responded unanimously that there were no problems with: alcohol or other drugs, theft of belongings of other workers, theft of equipment or suppliers from farm. Only one farm reported fights or physical violence among workers.



These are extra-ordinary statistics – much better than in normal society or other workplaces.

Table 6-6 Accommodation and facilities

	GA	·P	C	OC	Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		M L	E C
Partner can stay	51	49	51	49	NS	NS	NS
Children can stay	45	55	45	55	NS	NS	NS
Accommodation	98	2	100	0	NS	-	-
Meals	50	50	71	29	NS	Ns	10.6 NS NS
Drinking water	96	4	97	3	NS	-	-
Kitchen	89	11	87	13	NS	-	-
Toilet	97	3	97	3	NS	-	-
Bathroom	95	5	97	3	NS	-	-
Washbasin	48	52	68	32	2.8 (1.1,7.0)	NS	NS
Car for use	26	74	45	55	3.3 (1.2,8.9)	NS	NS NS 5.3

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

1.5 Relations with community

Shrimp farms look for diverse ways to engage in activities with local communities because good relations help avoid problems with theft and other complaints. An ACC farmer summarized this positive position towards communities succinctly "There are no problems with the community because in each village where we have a farm when they ask for help we give it."

COC farms had more positive impacts on local community development than GAP farms, in particular, in terms of communication and water supply infrastructure (Table 6-7). Larger farms supported more associated industries (Table 6-7). COC farms were also more likely to make direct donations to communities and sponsor mangrove planting (Table_ 6-7). COC farms engaged more in shrimp-related and public activities than GAP farms (Table 6-7).

We asked farm owners (n=232) about various kinds of possibly negative impacts their operations may have on surrounding resources used by others (S9). All responded



unanimously that there were no problems with: competition for water with other uses, discharges of contaminated water, salinization, roads, waste disposal or reduced access to local roads. Virtually all farm owners said they had received no complaints from: other shrimp farms, village headmen, rice farmers, nearby villagers, fishermen or collectors of aquatic plants and animals.

In-depth interviews (n=27) with members of surrounding communities suggest that despite these efforts and improvements in practices related to certification that there were still adverse impacts on livelihoods around almost half the farms. One affected household told us:

"Salty water seeps into my land. I cannot use the water at all. I have no freshwater water to use. I cannot plant anything on the land. The water is too salty. Our car gets rusty faster than others....They steal electricity using it to aerate their ponds. In the end there is not enough electricity for the villagers to use. Electricity cuts-out all the time."

Another talked about their loss of access to irrigation water:

"if this canal has no water we are finished, because we don't have anywhere else to get water. In the past we used this canal to get water from the Ranod Canal to irrigate our rice; now the canal is used for shrimp ponds."

A local government official also reported complaints over releases of chemically treated water from large farms. These releases apparently affected oyster aquaculture activities. A hatchery owner, on the other hand noted that some of the control practices for a freshwater snail pest had impacts on their operations. Overall frequency and level of current conflicts between communities and shrimp farms or hatcheries identified in this study was low.

Table 6-7 Positive and adverse impacts on community

Impacts on local community	G.	Λ P	сос		Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		M L	E C
Positive							
Communications	10	90	36	64	7.6 (2.5,23)	NS	***
Electricity	13	87	27	73	Ns	NS	***
Water supply	5	95	15	85	4.6 (1.1,20)	NS	***
Shops	14	86	18	82	NS	NS	NS



Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

Table 6-7 Positive and adverse impacts on community (cont)

Impacts on local community	G.A	Λ P	C	OC	Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes (%)	No (%)	Yes (%)	No (%)		M L	E C
Associated local industries	20	80	30	70	NS	3.4 2.6	NS
Local tax	16	84	21	79	NS	Ns	***
Local employment	35	65	52	48	NS	Ns	0.38 NS NS
Donations for community	49	51	76	24	4.2 (1.4,13)	5.1 2.8	0.38 0.22 4.4
Mangrove planting	25	75	55	45	5.5 (2.1,14)	NS	0.08 0.02 0.21

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant

<u>Table 6-8</u> Activities with others

Active involvement in	GAP CO		COC		Certification (GAP) COC	Farm Size (S)	Region (S) A
	Yes	No	Yes	No		M	E
	(%)	(%)	(%)	(%)		L	С
Shrimp grower's club or association	50	50	88	12	9.1 (2.7,30)	NS	3.8 NS 8.7
Training	63	37	94	6	11.8	3.1	6.1
about shrimp					(2.4,57)	NS	NS
							22
Community	51	49	91	9	9.7	6.2	NS
activities					(2.5,38)	4.1	0.03
							NS

Note: S – South Gulf of Thailand, A –Andaman sea, E –Eastern region of Thailand, C – Central region of Thailand; NS – Not significant



2. Emerging governance issues

2.1 Interaction, capacity and accountability

Certification and labelling schemes raise at least three important governance issues for the Thai shrimp industry: interaction with other policies, capacities for implementation and accountability.

First is the need to recognize that such schemes do not work in isolation from other policies and regulations and are therefore unlikely to be sufficient on their own to secure a sustainable shrimp industry. Many schemes require compliances with national labor and environmental regulations which are rarely followed by businesses in other sectors, in particular, in the agricultural sector, where "farms" are often not treated as "small firms". Certification as a form of private governance will often be insufficient on its own if other supporting regulations are not in place or in place but not implemented. A related concern is that certification on its own may not be doing enough to make the aquaculture-based commodity chain, sustainable (Huitric et al. 2002; Lebel et al. 2008; Neiland et al. 2001).

Second is the need to acknowledge the importance of capacity building and setting achievable, if progressive, standards or otherwise risk excluding most businesses, and thus having little impact on dominant practices. Foreign certification and labeling schemes are proliferating, each in a sense, trying to capture control of a particular market channel as much as influence on-the-ground practices. Exclusive schemes will never play much role in the pursuit of better practices (Boyd et al. 2002; Boyd et al. 2005) which could transform the sustainability of shrimp aquaculture industry. Improved capacities of local communities, governments and agencies to train, monitor and regulate is also needed otherwise the schemes on paper will rarely become practice.

Third, and related to the previous two, is the balance between seeking independent, standardized, certification procedures, and taking adequately into account diverse local circumstances and conditions (Vandergeest, 2007). Foreign schemes often appear, at first inspection, as "peculiar" in the Thai context as the assumptions they make about consumers are unfamiliar (e.g. organic) and producers circumstances, rough. But even nationally-driven schemes may have problems of fit when they have been built to serve large operations without adequately taking into account the needs and resources of small household based farms with little spare land, small savings and no employees. Improving the accountability of certification schemes is crucial.

2.2 Power relations

These three governance issues also hint at the underlying issue of power relations and how these are affected by the introduction of different certification schemes. In this study we heard repeatedly how shrimp buyers have an inordinate influence on prices

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



and suggestive evidence that standards and other requirements are tools of further influence and control: "The market belongs to buyers. Buyers set everything. Standards are set by buyers. Prices don't rise. If you don't meet the criteria they won't buy."

Most see reason for power of buyers in the frequent over-supply of shrimp that drives down prices. One way forward might be through contract farming but there are problems. Farmers are worried about controlling investment relative to contracts and whether those offering contracts are in collusion with buyers.

The emergence of ACC certification can be seen as an expression of corporate retail power (Fuchs et al. 2009). Walmart was a key actor in the emergence of the scheme and continuing push for its expansion (Lebel et al. 2008). The rejection of Thai certification schemes buy foreign buyers requiring products and production methods meet other sets of criteria is another illustration of the politics in global agri-food systems. The interest of certifying organizations also has to be recognized: they benefit from the proliferation of standards. The extent to which foreign consumers are complicit in these actions or also at the mercy of retailers is another question.

Power relations are also important within local communities where shrimp are grown. Early studies of shrimp aquaculture industry raised concerns about its impacts on surrounding communities. Researchers, beginning with Bailey (1988) pointed out some of the problematic features with respect to property rights and access to mangrove and coastal wetlands (Bailey & Skladany 1991).. Aquaculture can take away access to coastal resources of poor families who depend on them. In earlier work in southern Thailand we identified some highly vulnerable households for whom loss of access to collecting and fishing in coastal creeks and mangroves was important. The ecological impacts with largest effects on local inhabitants were sedimentation and pollution of coastal and mangrove creeks and the salinization of crop areas and drinking wells (Lebel et al. 2008)..

In this study modest evidence of adverse community impacts was found from interviews with households engaged in alternative livelihood activities in contrast to overwhelmingly positive views presented by farmer owners and other stakeholders. Local governments also noted occasional impacts and disputes. Several of the schemes make important references to "local" laws and the ACC, for example, specifically encourages interaction with local leaders. Overall, shrimp farming practices may be improving. The low level of complaints and overt conflict in the communities in established shrimp growing areas, however, can also be understood by the power imbalance between those involved in the industry and those not with the former often with much stronger relations to local political authority.



2.3 Decision-making procedures

The three governance issues identified above also highlight the tensions between public and private governance, and how certification and labeling schemes, often sit in a complex, negotiable, space in between. This suggests that the political process by which such schemes are introduced and refined may be as important to success and fairness as the details on practices that they specify.

The implementation of Naturland's organic labeling is a good micro-example of what might be possible. In this scheme that many of the fine details of the overall guiding principles are negotiated between the farm and technical committee which then proposes changes to independent group for acceptance and auditing. The WWF dialogue approach to aquaculture farm indicators is another good example that promises to go beyond black-and-white criteria to a more graded system which could encourage progressive improvement.

But in these wider arenas for schemes meant to be inclusive (as opposed to nichemarkets like organic) adequate representation of the interests of smaller farms (and hatcheries), is a key issue. Key state agencies and private firms are invariably much better prepared and resourced to get their views heard and explored in dialogue and consultation events, which are often held in Bangkok, and sometimes even in English.

Parallel problems, but without language differences as an excuse, beset many "consultations" convened by Thai government agencies to promote their own schemes. The notion of engagement or participation as two-way remains remote from many actual bureaucratic practices. Instead officials from government agencies and the experts they use to communicate are often just in the mode of telling farmers what they new schemes is and what they should now be doing.

Although the increasing use of public "consultation" exercises in developing and refining certifications schemes should be applauded, the way they are conducted still needs a lot improvement. Two things are crucial. Firstly to expand the opportunities for meaningful participation by small farm businesses in the negotiation of certification and labeling schemes. Secondly to document and analyse the impacts of different certification schemes on practices and bring these experiences back to improve those and new schemes. Without proper representation and no opportunities for learning certification schemes will remain exclusionary and peripheral to mainstream practices. Dialogues are also important in challenging dominant perspectives that adoption of better practice guidelines, codes and standards will on their own make shrimp industry sustainable (Bene 2005).



CHAPTER 7 Economic analysis of shrimp supply chains

1. Shrimp supply chains

Shrimp supply chains in Thailand is relatively the number of agents; consulting and training services by feed and chemical companies are only just beginning. However, where the hatchery is present, many of the secondary input and services also include in the chain. Shrimp farm is the most important agent of the supply chains; it starts to produce shrimp to many agents in the chain. Starting to sell shrimp from farm to marketing agents, there are many relatively agent such as central wholesale market, processing plant, exporting company and importing company. For more detail will be present next section.

2. Marketing channel and opportunities

The structure of markets where Thai shrimp products are sold domestically and internationally shows in Figure 7-1. There are three channels to sell shrimp product to Mahachai central shrimp market, processing plant and middleman (fishing raft or broker). The Mahachai central market is the most channels to sell shrimp to domestic market and export company via middleman. Most of middleman sells shrimp to processing plant and a few middlemen buy shrimp from Mahachai market to processing plant for exporting. In addition, Mahachai market is also selling to wholesale and retail for domestic market and export company is important agent to export shrimp to international market.

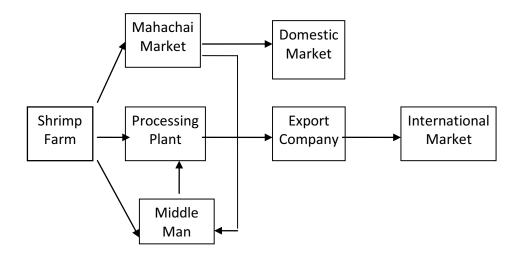


Figure 7-1 Marketing channel of shrimp product.



In this study, we have found that most farms harvest all their ponds at the same time (Table 7-1). Most shrimp are sold to middlemen (Table 7-2). COC farms sell relatively more shrimp to processing plants than GAP farms. A few farms sell directly to Mahachai Market.

Table 7-1 Percentage of farms harvesting crops in a single or in multiple harvests

Farm-level harvesting practice	GAP %	COC %	Total %	
Multiple partial harvests	21.2	23.7	21.9	
Single complete harvest	78.8	76.3	78.1	

Note: n (GAP) = 217; n (COC) = 38

Table 7-2 Farms percentage of selling

Selling to:	GAP	COC	Total
	%	%	%
Processing plants	16.5	32.0	19.1
Middleman (fishing raft or broker)	77.1	62.0	74.6
Mahachai Market	6.4	6.0	6.3

Note: n (GAP) = 249; n (COC) = 50

GAP and COC farms sell roughly similar-sized shrimp (Table 7-3). COC farms don't sell shrimp that are larger than 40 shrimps per kilogram.

<u>Table 7-3</u> Most common size category of shrimp sold (Percentage of farms)

Size per kg	GAP	COC	Total
Less than 40	2.51	-	2.16
40-49	11.06	21.21	12.50
50-59	18.09	15.15	17.67
60-69	26.63	30.30	27.16
More than 69	41.71	33.33	40.52
Total	100.00	100.00	100.00
No. of farms	198	32	230

The issues covered in contracts between processing plants and farms are summarized in Table 7-4.

In case of selling with processing plants by sign a contract, the details in the contract of both COC and GAP farms are not different as price, quantity, lead time, GAP/COC documents, MD documents and quality of shrimps i.e. size, temperature of shrimp at the market and characteristic. Mostly of both GAP and COC farm, are over 23 % make



contract focused on quality and price more than others (Table 7-4). It is noticed that the contract of farms focused on MD documents more than GAP/COC documents especially the COC farms has used COC document only 3.33 %. However, 26.67 % of COC farms has a contract focused on about quality of shrimps, 20 % in about quantity and 10 % in about lead time which is more than GAP farms (i.e. in the same contract). But the percentage of both COC and GAP farms in making price contract are not different (i.e. about 23 %). So it is noticed that the shrimp price of COC and GAP farms are not different.

Table 7-4 Farms percentage of signing contract

Detail	GAP	COC	Total
Quality of shrimps (size, temperature of shrimp at the market and characteristic)	22.79	26.67	23.98
Price	23.53	23.33	23.47
Quantity	16.91	20.00	17.86
Lead time	8.09	10.00	8.67
GAP/COC document	10.29	3.33	8.16
MD document	18.38	16.67	17.86
Total	100.00	100.00	100.00
No. of farms (signing supply contracts)	136	60	196

3. Expenditures to meet certification requirements

3.1 Cost structure (before joining certification)

Because most of shrimp farm joined GAP certification, we can not gather data of farm before join certification. However, data from web site showed that in 2004 total cost of shrimp farm per rai was 102,161.34 baht. Beside, it is 42.03 percentage of the cost for shrimp feed and 27.19 for post-larvae (ชวนพิศ, 2553)

3.2 Cost structure (after joining certification)

To meet certification requirements some farms needed to invest, for example, in fences, housing, toilets, chemical stores, offices, and establishing data recording systems. There were also expenses associated with audits or monitoring (Table 7-7). On average the transition from non-certified to GAP cost around 80,733.35 baht, including about 50,000 baht is the most expense for office. Secondly is the expense for residence labour (30,000 baht). Besides, it is 10,750 baht for chemical store and 7,312.50 baht for repairing toilets. For meet the certification requirement of farm safety, it is 24,000 baht for building farm fence. The transition from GAP to COC, the most expense for maintenance data recording systems is important. It is 50,000 baht and secondly is the expense for building chemical store. In sum, on average the transition from GAP to COC cost around 118,000 baht(Table 7-5).



Table 7-5 The average expenditure of repairing farms to being Certification (unit: baht)

Benchmark	GAP	COC
Fence	24,000.00	-
Labour residence	30,000.00	10,000.00
Repairing toilets	7,312.50	10,000.00
Chemical store	10,750.00	50,000.00
Office for maintenance data recording systems	50,000.00	50,000.00
The expense for maintenance audit/monitor systems	-	-
Total	80,733.35	118,000.00

3.3 Costs associated with the upgrading from GAP to COC, and COC to ACC

Both of GAP farms and CoC farms get the certificate and the expense for maintenance audit/monitor systems free of charge. Because of these activities work by the DOF officers. However, the farm must have some cost of upgrade farm such as water treatment, farm sanitation and document management. Because the transition from non-certified to GAP is basic for most of the shrimp farms, but for upgrading to CoC is higher standard than the GAP. The average expenditure of repairing farms to being CoC is higher than average expenditure of GAP. In case transition from CoC to ACC, most of cost are expense for maintenance audit and monitor systems. The expenses consist into three items as following:

- 1. Evaluated farm expense: there are two types of evaluated farm. Firstly, single farm evaluated expenses about 100,000 Bath. Second type is group farm evaluated expenses less than about 30,000-40,000 Bath.
- 2. Farm water testing expense for upgrading to ACC, the expense per year is about 7,000 Bath and the farm must have water testing at least one times in year.
- 3. Farms with annual production of up to 500 metric tons of whole shrimp pay a minimum fee of U.S. \$500. Farms with over 500 metric tons capacity add U.S. \$1 for each metric ton of annual production beyond 500 to the minimum fee, up to a maximum of U.S. \$4,000. For example, a farm with 700 metric tons of annual production would pay the U.S. \$500 minimum plus an additional U.S. \$200 for the 200 metric tons over 500, for a total of U.S. \$700.

In summary, the expense for upgrading from CoC to ACC farm is about 40,000 to 1 million Bath depend on farm facilities especially, building cost and farm water management.



4. Changes after joining certification

4.1 Changes on cost structure

For the vast majority of farms certification had no impacts on regular costs (Table 7-5) or derived benefits (Table 7-6). There were, however, some significant initial costs for some farms to meet certification criteria.

<u>Table 7-6</u> Percentage of farms separated by the change of cost after joining certification

Change of cost		GAP		COC		
	decrease	stable	increase	Decrease	stable	increase
Post-larvae		99.50	0.50		100	
Feed		99.50	0.50		100	
Fuel/Oil		98.99	1.01		100	
Electricity		100			100	
Pond cleaning		99.49	0.51		96.97	3.03
Maintenance cost/repairing pond and machine		100			100	
Household labour		100			100	
Hire labour		100			100	
Post-larvae transportation		98.99	1.01		100	
Product transportation		100			100	
Post-larvae checking		99.49	0.51		100	
Land tax		100			100	
Land rent		99.43	0.57		100	
Interest rate		100			100	
Opportunity cost of land		100			100	
Depreciation of farm asset		100			100	
Total variable cost		100			100	
Total fix cost		100	_		100	
Total cost		99.50	0.50		100	



<u>Table 7-7</u> Percentage of farms that changes products, price and revenue after joining certification

The change	GAP			COC		
	decrease	stable	Increase	decrease	stable	increase
Products	0.50	99.50	0.50	-	100	-
Farm price	1.51	98.49	-	-	100	-
Product value	1.01	98.99	-	=	100	-
Net Income per rai	0.50	99.50	-	-	100	-

4.2 Comparing cost and returns of GAP, COC and ACC shrimp farming

Shrimp feed is one of the most important components of total cost averaging about 60% (Table 7-8). About 17% of the total cost is for energy use on the shrimp farm (i.e. gasoline and electricity). When comparing variable cost items it is apparent in Table 7-8 that costs for ACC farms are frequently the highest. Variable costs of COC farms are usually higher than on GAP farms.

Fixed cost (i.e. land tax, land rent, opportunity cost of land and depreciation of farm asset) of GAP and COC farms are very similar, but much higher for ACC farms. Thus overall, costs for ACC farms are highest, COC intermediate and GAP farms lowest (Table 7-8)

The financial returns to shrimp farming can be measured in terms of the value of shrimp production and net income. The value of production of COC farms are higher than GAP farms by about 9.5 % with ACC farms about 25.25 % higher again than COC farms (differences in value from Table 7-8). Likewise, net income of COC farms are higher than GAP farms about 14.9 % and net income of ACC farms are higher than COC farms by about 8.6 % on average. Although ACC farms have value of production higher than COC farms, the average shrimp price of ACC farms are lower than COC farms, because shrimp price fluctuation are lower during the time ACC survey.



<u>Table 7-8</u> Cost and Returns for GAP, COC and ACC shrimp farming (unit: baht per rai per crop)

Items	GAP	COC	ACC*
Post-larvae	9,427.39	11,841.72	13,625.00
Feed	86,766.91	97,744.53	123,587.44
Oil/Gasoline	9,498.92	11,937.50	5,000.00
Electricity	15,141.74	16,871.00	36,128.56
Pond cleaning	2,064.91	2,050.00	2,437.50
Maintenance cost/repairing pond and machine	2,616.59	5,708.44	3,250.00
Hire labour	2,583.90	2,869.75	4,187.50
Commission from harvested	2,132.30	2,063.89	2,280.00
Land tax	6.17	6.67	5.00
Land rent	2,765.79	2,333.00	5,000.00
Opportunity cost of land	2,442.86	3,000.00	3,500.00
Depreciation of farm asset	2,500.00	2,500.00	7,500.00
Total variable	130,232.66	151,086.83	190,496.00
Total fix cost	7,714.81	7,839.67	16,005.00
Total cost	137,947.47	158,926.49	206,501.00
Yield per rai (Kg)	1,878.29	2,055.91	2,575.00
Farm price	111.68	117.44	115.00
Value of production	209,767.59	241,445.96	296,125.00
Net income per rai	71,820.12	82,519.47	89,624.00

Note: * Data used for calculating the cost and return was obtained from interviewing 4 ACC farms.

5. Value chain analysis

The shrimp supply chains are consisted of a number of agents. These agents create value chain such shrimp farm, hatchery, feed companies (both feed for hatchery farm and for shrimp farm) and processing plant. In fact, every chain cannot calculate value chain in cash money, but we can identify the value chain in non-cash money likely benefits from opportunity to sell product quickly, expanding market and reduce competitive to trade.

ACC hatcheries can create value chain to shrimp farm by selling higher price of larvae. From interview the GAP hatcheries, they can sell higher about .02-.08 Bath per larvae, meanwhile the ACC hatcheries can sell about .10-.12 Baht per larvae.

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In case of ACC certificate, shrimp exporters and processing plants can create value from increasing export price. Then the exporters encourage or support shrimp farm to get the certificate by pay some expense for maintenance audit/monitor systems. ACC farms can create value from opportunity to sell product quickly and increasing quantity sell, because buyers trust in shrimp produce from ACC farms.

The most important role to create value chain is shrimp exporters and processing plants. Although ACC plants can create value from increasing shrimp export price but the ACC plants have many expenses to get certificate. After a successful evaluation inspection and review, the processing plant pay a certification fee based on the amount of shrimp product exported worldwide in the previous calendar year. Processing plants with annual exports of up to 1,000 metric tons of finished product pay a minimum fee of U.S. \$2,000. Processing plants with over 1,000 metric tons of exports add U.S. \$2 for each metric ton of annual exports beyond 1,000 to the minimum fee, up to a maximum of U.S. \$12,000.

For each successive year, plants shall pay an evaluation inspection fee of U.S. \$5,000 prior to the inspection and a recertification fee of \$2.00 per metric ton of shrimp exported, with a minimum recertification fee of \$2,000 and a maximum of \$12,000. Processing plants have up to 60 days past the recertification date to complete recertification (Aquaculture certification council, 2010)



CHAPTER 8

Certification and the sustainability of shrimp aquaculture

1. Shrimp certification and sustainability

In the past, the quality of shrimp products was the primary concern in most markets. Standards, certification and traceability schemes focused primarily on food safety and health issues. In recent years, however, buyers, retailers and consumers have, in addition, looked for assurances about the quality of production processes including environmental protection, social responsibility, and animal welfare.

Certification schemes have been modified and new ones introduced to respond to these market concerns. Market access is now strongly linked to certification. There are now several certification schemes around the world being promoted and applied to the shrimp commodity chain. These have been developed by governments, retailers, industry associations and international bodies and applied at national, regional or international levels.

Thailand was the first country in the Southeast Asia region to develop and implement shrimp certification schemes at the national level with GAP and COC schemes introduced since the year 2000. The Department of Fisheries played a key role in developing, promoting and implementing these national schemes. The expectation is that GAP and COC will make the shrimp aquaculture production system in Thailand more responsible, ethical and sustainable. In addition, it is also anticipated that the national certification systems will be used as a reference and quality assurance system to re-assure and inform retailers/buyers about the quality of Thai shrimp and thus an important tool in maintaining the sectors' competitiveness in global markets.

Even though Thai shrimp products are certified by national certification schemes, alternative certification schemes are also being promoted in some markets. At least 18 certification/labelling schemes have been developed by Non-Governmental Organizations (NGO) or private sectors are proposed to be used in shrimp aquaculture (See Chapter 2). Some of these are more stringent than the national schemes or cater for particular niche consumers — like organic certification. Thai farms, hatcheries and processors are under increasing pressure to maintain market access and competitiveness while also meeting increasingly stringent requirements of export markets (Lebel et al. 2010).

In the final chapter of this report we synthesize the findings from the preceding analysis to assess the contributions that certification schemes have made to sustainability of the shrimp aquaculture industry in Thailand and how that contribution could be enhanced.



2. 'Meanings' of sustainability

Different stakeholders in the global shrimp aquaculture industry have different perspectives on the meaning of sustainability. Understanding these differences is important to evaluating and improving certification schemes. Agreeing on a shared, practical, meaning of sustainability in particular places, sectors or commodity chains typically requires negotiation (Kates et al. 2005; Lebel et al. 2008). Sustainable development, as defined by FAO, is:

"The management and conservation of the natural resources base and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sector) conserves land, water and animal genetic resources, is environmentally non-degrading, technologically appropriate, economically viable, and socially acceptable."

Different stakeholders have different targets and priorities with respect to sustainability. Consumers want good-quality, safe, shrimp products at affordable prices; at the same time, they may also expect that retailers will source products from a sustainable source. Retailers seek products with reliable supplies and that consumers will buy and use marketing techniques to shape consumer preferences as well as meet demands. Processors look for good-quality, standardized, raw materials at low prices to maximize their profits. Hatcheries and farmers are interested in maximizing productivity and sale prices while minimising production costs and any environmental impacts that could feedback to affect their own production systems. Suppliers of feed, chemicals and other inputs want farmers to use their products while securing good quality and cheap inputs. Government stakeholders are themselves diverse with some agencies interested primarily in industry expansion and export promotion and others more concerned with environmental and social development impacts.

Retailers and consumers play an important role in determining how the products should be produced. Quality and food safety attributes are typical priorities of consumers. Globally, there is a perception among many consumers that shrimp aquaculture production activities are not yet sustainable. From the perspective of producers, processors and retailers, certification schemes are seen as a communication tool to inform consumers that shrimp products meet certain sustainability criteria.

Certification schemes — as a set of principles and indicators — are designed, in part, to cover the attributes perceived as important to buyers and end consumers. Typically these principles are related to environmental protection, social responsibility, traceability, and animal welfare in addition to food quality and safety control. Different certification schemes emphasize different dimensions. For instance, Thai GAP is mainly



focused on food safety and hygiene management. Thai COC, GLOBALG.A.P. and ACC generally emphasise on environmental protection, social responsibility, and traceability. Organic certification pays attention significantly to environmental protection (see Chapter 4).

Buyers usually want the certification that their own country has established. Thus, GAP and CoC are not accepted by importing countries whereas private certification schemes (i.e. ACC, GLOBALG.A.P., and Organic) are preferred. It was hoped that the coming ISO standard on aquaculture certification would be recognized and accepted at the international level.

3. Structure of the shrimp aquaculture industry

The structure of shrimp industry, as an international commodity, has a very long supply chains involving a number of stakeholder stretching from local producers, traders to oversea consumers (Figure 8-1). The shrimp supply chain is more complicated with associated input suppliers (e.g. post-larvae, feed, and chemical) and various market channels for farms (e.g. direct sale, indirect sale via auction market or middlemen) and processors (e.g. direct sale to restaurants, supermarkets, and retailers or indirect sale via traders). In terms of relationships between stakeholders (Figure 8-2), farmers can influence feed by specifying the quality level of feed required to ensure a high productivity and production cost that can be competitive. On the other side, feed mill may consider to increase the price of feed when the shrimp price is increased. In contrast, the relationships between hatchery-farm, farm-processor, and processordistributor are more hierarchy. Distributors act as the middlemen to gather the specified products from buyers/end consumers in overseas countries so they influence processors to plan their production processing accordingly. Processors always specify the size and quality of shrimp raw materials that they want, in according to the order that they have to deliver to clients. While farms also demand hatchery to provide goodquality post-larvae in order to ensure a high survival rate in culturing ponds. To the final end, the relationship between distributor and end consumers are market-based depending on the willingness to pay of consumers for the quality of shrimp products required.



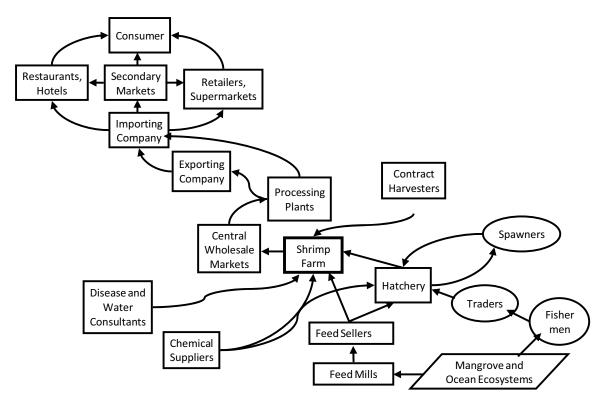


Figure 8-1 Structure of the shrimp aquaculture industry and associated stakeholders

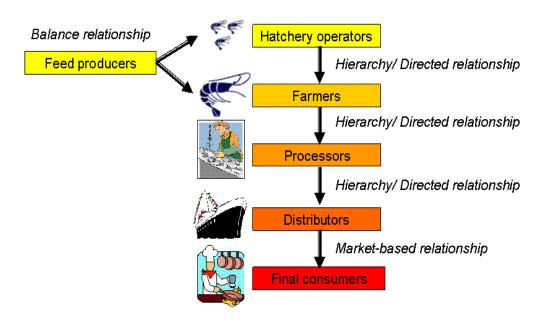


Figure 8-2 Relationship between different associated stakeholders



<u>Table 8-1</u> Roles of shrimp stakeholders

Shrimp stakeholders	Roles in the shrimp farming industry
Policy makers:	Involved in the development, promotion and
Department of Fisheries	implementation of shrimp certification; Doing
	research and development on shrimp farming
	techniques and management strategies and
	transferring the knowledge to shrimp farmers
Governmental organisations:	Controlling the potential environmental impacts
Office of the National Economic and	from shrimp farming activities
Social Development Board, Office of	
Environmental Policy and Planning,	
Pollution Contorl Department.	
Governmental organisations:	Controlling the use of veterinary drugs in shrimp
Department of Livestock	farming activities
Researchers:	Doing research and development on shrimp
Universities and research organisations	farming techniques and management strategies
Shrimp producers:	Producing post-larvae to support the production at
Hatchery operators; farmers and	farm and further processing to final shrimp
workers, harvesters, shrimp processors	products
and staff, packaging producers	
Shrimp associated industries:	Supplying inputs required for shrimp production
Trawler operator and fishermen; feed	processes
mills; aerator manufacturers; packaging-	
material producers, etc.	
Agencies:	Collecting shrimps from farm to the auction
Brokers or middlemen	markets or processors
Financing institutions:	Providing financial credits and loans to producers
Bank or commercial institutions	
Affected communities:	Directly gain benefits as well as suffering from
Local commnuties and people	negative impacts that may arise as a consequence
T /	of the shrimp aquaculture production activities
Traders:	Trading shrimp products
Thai Marine Shrimp Farmers Association;	
Thai Frozen Foods Association; and Black	
Tiger Shrimp Farmers Producers and	
Exporters Association, etc.	
Wholesalers and retailers:	Delivering shrimp products to intermediate buyers
Supermarkets	or consumers
Consumers:	Supporting the industry and shaping the product
End consumers	types and hence the production methods required
Campaigners:	Campaigning particularly on the environmental
Media and Non-profit Governmental	issues associated with shrimp farming activities
Organisations (NGOs)	



The long-term sustainability of the shrimp business is strongly related to the consumer expectations and acceptance in shrimp products as well as the production capacity of producers to meet the requirements from consumers. It can be seen that each stakeholder is associated with certain environmental, economic and social issues (Table 8-1).

The organization of the industry and marketing routes for shrimp has implications for efforts to improve the effectiveness of certification schemes.

From the perspective of certification schemes the important feature of the production-consumption system within Thailand is that there are hundreds of hatcheries, thousands of shrimp farms, and much fewer processing plants and exporters (See Chapter 1). The shift from black tiger to pacific white shrimp during 2001-2006 led to a modest reorganization of the industry – for instance reducing number of hatcheries and reliance on ocean-caught spawners (Lebel et al. 2010).

There are three main marketing routes of shrimp in Thailand (See Chapter 7). First, through Mahachai market the primary source for domestic markets, but also, via middlemen, an important source for processing firms and eventual export. Second, sales made directly to processing firms and then on to exporters. Third, through middlemen which supply processing firms. The marketing routes of shrimp from COC and GAP-only certified farms are similar with more COC farms selling directly to processing plants. With the introduction of certification schemes, especially from private sectors from abroad, buyers will make a request of certified product through local processors. In some cases, buyers contact directly to farms and then encourage a relationship between farms and processors by using a contract farming system

Some major retail firms apply their own quality assurance schemes to buy shrimp from sources in Thailand. Mark & Spencer, for example, believes that its purchasing policies and procedures are much more stringent than existing certification schemes and secure higher quality shrimp. They have been observing the movements on shrimp certification development and implementation while still positioning their business to rely on the brand royalty of consumers. They prefer to apply their own certification (i.e. Code of Practice of M&S) rather than using a particular existing certification scheme to source their products. Their main requirements are related to quality, environmental and social standards with consideration of the uniqueness of production site that they can sell the extra values or premium to their clients. However, organic is accepted as a premium product for them. In contrast, the broker AquaStar Europe buys shrimp using a mixture of procedures. They rely in part on national certification schemes as a general indicator of quality control over commodity chain, but also apply overseas certification schemes if clients ask for them. They use compliance with certification schemes as a baseline to identify potential suppliers, but their own standards for final selection and



improvement of supply chains. They emphasize having their own staff checking current and potential suppliers as well as third-party audits as needed as key.

4. Entry and exit of shrimp certification

A wide range of certification schemes have been proposed (see Chapter 1) but only a few are in use within Thailand – Thai GAP/COC, ACC, and Organic. Entry into (and exit from) certification schemes is influenced by many factors. Farms, hatcheries, and processing firms need to consider expected benefits and costs of different schemes carefully. The promotional effort of other actors, including buyers, certifiers and regulators, also influences rates of adoption.

Most of our insights came from studies of farms. Farmers choose to enter particular certification schemes for a variety of reasons. Promotional activities of DoF were crucial and identified by many actors as the main reason for farms joining GAP and COC certification. Requirements by local processing plants that supplier have GAP certification (purchasing policies) to ensure the guarantee of food safety particularly in terms of chemical residues strongly reinforced DoFs campaign. GAP certification became, essentially, a requirement for any processing plant if farms wanted to sell shrimp. Shrimp clubs and associations and buyers also encouraged farmers to join to demonstrate the group's quality assurance for buyers.

A very few farmers, especially managers of large farms, saw certification as a way to standardize and improve their farm management systems. They foresaw that a cleaner, tidier and less polluting farm would be more acceptable to oversea markets and useful in expanding to other certification schemes in the future if needed.

The implementation of GAP is aimed for all farms throughout the country. The number of certified GAP farms is increasing, while the number of COC-certified farms is rather constant. COC is perceived that it is too demanding. Farmers were critical of some criteria believing them to impractical – for instance related to farm layout requirements for sedimentation ponds and water storage or position of workers' accommodation relative to ponds. Small farms with little land do not have the space to make these adjustments. There were also some concerns about the quality and timeliness of certification procedures. Some farmers think that there are not enough auditors. More importantly, COC is not requested from local and overseas buyers.

The GAP licenses of many farms are now expired, to wait for the revised version of GAP to take into effect. Farmers are concerned with the certification procedure, particular to the requirement of auditor from one province to conduct the farm auditing in another province. They also rose that the practical issues must be considered in the revised

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criteria not to add more burdens to farmers. Interestingly, they asked if COC and GAP could be combined as one standard so as not to cause confusion among farmers as well as farmers unless COC is clearly explained to buyers as COC-certified shrimps are distinguished from GAP-certified ones.

The primary reason for joining ACC certification on the other hand was because of requests to do so from overseas buyers who make such a request to local processors. Local processors convince farms to join by offering the cost sharing (i.e. processors financially support the farms for the certification costs but farmers have to be responsible for the costs associated with farms improvement especially facilities such as workers' accommodation, site entry, feed storage room, etc.). Most farmers expected that joining "advanced" schemes (private or international certifications scheme) would increase market opportunities. Many farmers expected to get a premium price for certified shrimp from processors and their buyers.

For ACC farms, most of the farms that joined ACC have previously been certified as GAP only, COC only, or both. They found GAP providing basic requirements on food safety and hygiene management and COC supporting to prepare themselves to implement ACC in terms of record keeping, wastewater treatment and relation with community.

Processors offered similar reasons to farmers. They joined ACC at request of main retail client in the US. They are encouraged from buyers with a premium price, which provides an incentive. Moreover, they found implementation of ACC for a processing plant relatively easy due to the previous experience in implementing food safety standards such as HACCP and BRC. There were some modest, additional, costs associated with wastewater analysis. The processing firm also joined because they wanted to prepare themselves to meet expected future requirements.

Although GAP certification is virtually universal many farms choose not to join COC or other more advanced certification schemes. A common reason given by farmers is that they found it difficult to understand the principles and criteria or how to implement them in practice. For foreign schemes, weak English language skills and lack of familiarity with information technologies can be barriers. The proliferation of schemes is also a source of confusion and uncertainty.

Farmers were also concerned about costs associated with farm improvements to meet certification criteria, especially in the case of ACC certification. Farmers were also skeptical that after making these investments that they would get a higher selling price and thus saw little incentive for joining.

The implementation of organic certification is linked to the expectation of farmer on marketing channel to a niche market with premium price, under the demonstration project supported by GTZ. The organic shrimp farming concept is well acceptable by



farmer, and some practical issues were raised for certification developer to consider for adjustments. However, a premium price gained cannot be compensated with the higher production cost mainly connected to the cost of organic feed. There is no expansion to other farms, due mainly to the foreseeing of technical difficulties and limited markets for organic shrimps.

Table 8-2 summarises the reasons for farm to join or not to join a certification scheme. The main reason for farms to join or not to join a certification is strongly linked to the market demand. For national certification schemes, the main driving force is from the local processors that use GAP as the requirement of purchasing policy in addition to other quality attributes as well as physical characteristics such as size. For group farms or shrimp associations/clubs, GAP is also used as a pre-condition to join a membership to ensure that all farm members will have a certain standard of shrimp farming practices. The use of GAP as a pre-condition to apply for bank loans is another factor influencing farms to join. However, the similar prices and the non-distinguishment of certified and non-certified shrimps discourage farms to join a certification. Especially for Thai COC, farms are not interested in joining as it is not required neither from local processors nor overseas buyers. On top of that, the criteria related to farm layouts and wastewater treatment facilities stop farms especially small-scale farms to join as they cannot implement such criteria. In contrast, the technical and financial assistances from processors promote the joining of ACC through a contract farming system. Some farms identified their lacking of Eng knowledge and investment requirement are the main reasons of not joining the scheme. For organic, it is generally accepted that the organic farming systems will minimize the impacts on environment. However, the conversion from non-organic o organic is not easy especially with the sourcing of organic feed and associated processors.

<u>Table 8-2</u> Limitations of current shrimp certification schemes that discourage the joining from farmers

Shrimp certification	Main reasons for not joining	Condition for joining
Thai GAP	- No premium price - No distinguish between certified and non-certified shrimps	- Requirement from local processors - Requirement as a precondition to join a shrimp association or club - Requirement as a precondition from financial institution to apply for bank loan
Thai COC	- Cannot implement certain criteria (such as land title, farm layout with wastewater treatment facilities)	Requirement from local processorsRequirement as a pre-



	 No premium price No distinguish between certified and non-certified shrimps No requirement from local processors as well as overseas buyers 	condition to join a shrimp association or club - Requirement as a precondition from financial institution to apply for bank
ACC	No understanding on principles and criteria because of language difficulty Investment requirement No contract farming system No market demand	loan - Requirement from local processors and overseas buyers - Premium price to compensate with higher production cost - Technical and financial support from processors - Contract farming system
Organic	 Difficulties to implement the organic farming requirement Cannot do organic and non-organic in the same production sites Limited organic markets 	Premium price to compensate with higher production cost Requirement from local processors and overseas buyers Contract farming system

After joining a certification scheme, some farmers choose not to renew. Lack of demand and low prices were important factors especially given that costs of upgrading were borne by the farmers. There are many schemes using by various buyers so the farmers do not know which one they should join unless there is a contract farming system specify the required certification scheme from buyer.

5. Influence on practices

One of the main objectives of this project was to assess the consequences of joining certification schemes for farm practices, in particular, to assess whether they were becoming more sustainable.

A few lines of evidence suggest that COC or ACC certification schemes are associated with better practices.

Comparisons of COC and GAP farms show a few areas where COC farms are better than GAP-only farms. COC farms for example have better farm layouts including use of sedimentation ponds and water management practices (Chapter 5). COC farms tended to have better understanding about chemical use, store them better and train workers on safe use more often. On the other hand for many other practices COC and GAP farms were similar, for example, with respect to pond preparation and dry-out between crops, post-larvae sources, and feeding management practices.

On social dimensions COC farms appeared to be better, overall, than GAP farms in taking care of their workers (Chapter 6). Labor relations were more systematic.



Although workplace conditions were better on COC than GAP farms many still fell short of criteria. Health and safety practices in particular varied widely among farms. In terms of relationships beyond the farm gate COC farms had more positive impacts on community development than GAP farms and were more likely to engage in community and shrimp association activities.

ACC and COC are seen as the certification schemes that are strict on environmental issues and traceability systems. ACC is highlighted as the certifications scheme introducing the documentation systems in more details in addition to other requirements of COC. As the farms that joined ACC have previously been certified as GAP/COC thus the main improvements for farms are mainly linked to the documentation system as well as the more systematic farm management systems. The introduction of ACC through a cooperation with processor gave a very good impression to farmers to received both technical and financial assistances. Farms can also secure themselves through a contract farming system.

The costs associated with farm improvement, ACC certification procedure (farm auditing fee, monitoring program, and overhead from selling shrimps) as well as the online traceability system are the key factors affecting the production cost at farm level. Compared to GAP and COC, there is no cost for farm auditing and license registration – this is subsidized by Department of Fisheries at present. Financial institutions do not consider a certification into account when providing bank loans. As a result, certified farms feel that certification means higher investment and lower profits.

Organic scheme significantly improves the environmental performance of farms especially chemical use and organic feeds. However, organic feed has posed a difficulty in terms of organic feed ingredients and a feed mill that will continuously produces the organic feed for farm. Also, organic markets are rather limited and market demand is fairly fluctuating.

Drawing strong conclusions about the effectiveness of certification from such comparisons, however, is difficult because there is always a plausible alternative explanation: better managed farms are more likely to be the ones that join certification schemes. In other words joining certification may not be the direct cause of certification. Questions about changes in practices after entry allowed us to assess this factor more closely. In general COC-certified farms had higher levels of compliance than GAP farms prior to certification (Chapter 5). Overall entry into both GAP and then COC schemes both had positive impacts on farming practices when judged against practices prior to entry. As examples of specifics, joining GAP led to substantial improvements in chemical/antibiotic use and joining COC led to improvements in water quality. Farmers reported that certification also led to sharp falls in complaints about environmental impacts.



There are several possible pathways to impact of certification processes on farm practices. First farmers may adjust practices so as to meet certification criteria and acquire certification. Second farmers may anticipate future regulations and standards as a consequence of broader best practice discourse and adopt new practices even before they are required. Third and following on from the second, these better managed farms are more likely to join schemes because they already meet many of the criteria. Regardless of the exact strength of these different pathways it is reasonably clear that certification schemes are one of the factors driving better management practices.

6. Recommendations for improving the impacts of certification schemes

The contribution of certification schemes to the sustainability of shrimp aquaculture industry within Thailand can be further enhanced. In this final section we offer recommendations and options for improving the impact of certification schemes based on the findings of this study. We start with a simple stakeholder analysis.

Some of the key challenges which must be overcome in improving the impacts of certification schemes are revealed by a simple stakeholder analysis (Table 8-3). This analysis underlines several key messages. First overseas buyers are influential stakeholders but they have not yet been clearly convinced of the benefits of Thai GAP/CoC certification schemes. Second farmers are likely to oppose and negotiate because they bear costs without receiving clear benefits, for example, in terms of prices. Third, processors are an important supporter because they have leverage through their purchasing practices. Fourth, consumers are not likely to be as important as they are often portrayed in the success or otherwise of the certification scheme: buyers and the retailers they serve are much more important. This analysis is consistent with views of several stakeholders we interviewed that felt that responsible government agencies should invest more in public relation activities to promote Thai shrimp certification schemes in importing countries.

<u>Table 8-3</u> Prospective stakeholder analysis for policy initiatives to "strengthen management of shrimp aquaculture through Thai CoC certification schemes"

Stakeholder Group	Interest	Position	Influence
Guiding analytical question	What interests does the stakeholder have in the policy?	Does the stakeholder support or oppose the initiative?	Does stakeholder control or influence decisions?
Feed mills	Low	Neutral	Low
Hatchery operators	Low	Neutral	Low
Shrimp farmers	Very high	Oppose (costs w/o price benefits)	Medium (lobbying)



Processor	High	Support	High (purchasing)
Overseas Buyers	Medium	Not mobilized	High (purchasing)
Consumers	Low	Not mobilized	Medium
Department of Fisheries	High	Support (their	Medium
		scheme)	(promotion)

Several types of recommendations can be made for improving the impacts of certification schemes on sustainability – some focused on the schemes themselves and others on capacities or complementary policies. We discuss these in turn.

6.1 Certification principles and criteria

It is understood and widely accepted that the principles and criteria of national certification schemes should be based on existing standards that are internationally accepted (such as ISO 14001, HACCP, BRC). There is general agreement among shrimp industry stakeholders that the scope of the Thai GAP and COC schemes cover most areas of interest of buyers and issues of concern to consumers. To further strengthen the national schemes so they are more acceptable at the international level, we recommend the following areas for improvement:

- Use keywords that buyers are looking for in the principles and criteria of certification
- Clearly distinguish criteria outside the scope of activities on farms as criteria for hatcheries (e.g. sources of broodstock), harvesters (e.g. harvesting and post-harvesting methods), and processors (e.g. food safety controls for shrimp processing activities)
- Specify clearly requirements for farm registration, hatchery certification, feedquality testing, and national laws associated with shrimp farming activities, for instance, areas in which shrimp farming activities are allowed, effluent standards, lists of allowed/prohibited chemicals, and use of movement documents)
- Consider carefully the ability and capacity of small-scale farms to meet the requirements, and where this is likely to be difficult, help build capacity and step-wise procedures through which they can be met.

6.2 Certification implementation

To support wider implementation of certification technical assistance to and from Provincial-level DoF staff is crucial and needs be supported. One key suggestion is the development of training guidelines and user manuals that clearly explain practical approaches to comply with the required criteria under the main certification schemes. These tools should help promote wider application of certification and facilitate farm auditing procedures. The user manual should include:

• Outline of farm manual with an example of risk assessment (i.e. environmental, social and food safety risk as associated with all farming activities) with mitigation measures and monitoring program



- List of required documents including templates to help with record keeping
- List of allowed/prohibited chemicals
- List of nearby provincial DoF or private laboratories for PCR test or wastewater quality checking
- Checklist for self-assessment of levels of compliance prior to applying to join certification schemes as well as helping evaluate areas for further improvement to be in a full compliance. Checklist should also be useful for self-monitoring after joining the certification scheme
 - List of auditors
 - List of other useful sources of information on certification and farm-level practices

Another area where implementation can be improved is through supporting exchange of information on best practices and documenting how these meet criteria of various certification schemes.

6.3 Certification procedure

Several stakeholders felt that the scope of national certification schemes is generally suitable but the farm auditing process was the main weak link. The auditing by DoF who is also the certification developer and promoter leads to a lacking of credibility. Currently this issue is addressed by requiring that the auditor must from another province. We suggest that DoF staff should not be auditors and this role should be given to the private sector. Moreover, the qualifications of auditors should be based on international standards such as ISO, to be more reliable and acceptable at international level.

In addition, GAP and CoC farms should have the documents of farm auditing results available at site to show buyers. The documents should contain all necessary details; for instance, the PCR test report and should also provide the details of which pathogens are not found. The lack of clear evidence of audits on GAP and CoC farms is one reason buyers have moved to overseas certification schemes – these are more systematic and better documented.

The economic aspects associated with certification must also be taken into account. The joining of certification should not add excessive cost burdens to farms - especially small-scale farms where the relative costs are highest. The costs associated with joining certification schemes should not put producers at a disadvantage in competition with others in the global market.



6.4 Governance and institutions

Greater attention needs to be given to the overall governance of the shrimp aquaculture industry, in particular, the appropriate roles of different actors (Figure 8-3). This will help to arrive at better institutional framework for certification and standard schemes.. Some institutional reform may be necessary to more clearly separate out different roles within the Thai industry. For instance, a clearer separation between promotion and regulatory functions is needed. As noted above auditors should not come from the same organization which promotes farming as this undermines credibility. The public as residence in host communities directly and through elected local governments should also play an important monitoring role holding authorities and industry more accountable. Compliance with criteria of certification schemes and the aggregate results of audits can be used as independent guidelines on whether local practices are satisfactory or not.

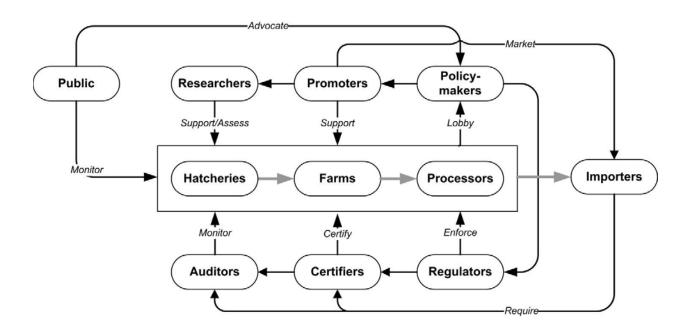


Figure 8-3 Improving governance of the shrimp aquaculture industry

6.5 Complementary policy

Apart from strengthening the national COC certification scheme promoted by DOF, there are several other areas of complementary policy which the Thai government should consider (Chapter 6), which are:



6.5.1 Single standard

It is suggested to combine GAP and COC as a single standard to reduce confusions both for producer and buyers, and at the same time competition between two standards for accessing the same markets. Moreover, the standard should be more presentable – clearly define the principle, criteria and control points or indicators for assessment together with the checklist that should be available for farmers as well as the public (in English version as well) to be transparent.

6.5.2 Increasing the confidence in national certification schemes from overseas clients

To increase confidence and trust in national certification schemes in overseas markets, it is highly recommended that the verification and certification systems must be improved; for example, verification should be handled by professional certify body whose qualifications meet the criteria of accreditation body and there must be no conflict of interest, there should be the department that will handle the questions from buyers on the standard issues, and the benchmarking study of national standards. There should be a open-house event organised in Thailand and invite potential buyers to do the site tour of supply chain production activities to ensure the assurance system by using national certification as well as other related laws and regulations in place.

6.5.3 Harmonization of different certification schemes

To promote harmonization or clear separation of different standards – national, private and international schemes – to reduce confusion around competing schemes. Since various schemes differ only slightly meeting requirements of both national and overseas schemes will only increase the production cost unnecessarily. It is important to note that any certification scheme should not cause the increased production cost to become less competitive in the global markets. Otherwise, the contract farming between buyers and processors/farmers must be clearly stated the agreement on pricing to ensure that farmers will not carry out the increased production cost by themselves

To establish the international certification that all countries will recognize and buyers will use, following the FAO Technical Guideline could be a possible way. The efforts of WWF to harmonize different shrimp certification schemes are good, but ISO should be involved as this is a recognized and accepted broker at the international level.



6.5.4 Benchmarked scheme & Memorandum of Understanding

From the situation being, several producing countries also develop the national certification schemes that overseas countries can use as a reference system. However, it is not practical for farmers when they are asked to also implement another certification schemes developed by the buyer countries. It is additionally advised that the benchmarking study should be conducted to demonstrate the equivalency of different schemes to be recognised as the benchmarked schemes. More importantly, Thailand should consider having MOU with exporting countries to accept the certified products based on the national certification scheme that is proved to be as equivalent as their own scheme.



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APPENDICES

Appendix 1: Certification schemes for shrimp aquaculture

Table 1-1: Thai GAP

Principle	Criteria
1. Farm site and registration	1.1 Farms not exposed to environment risk that can affect
	shrimp health and safety of consumer
	1.2 Farms located closed to good source of water
	1.3 Farms recommended to be easily accessible to road or any
	transportation
	1.4 Farms registration with Department of Fisheries
	1.5 Farms have title to land or own legal rights for land use
	1.6 Farms must be located outside mangrove and/or
	conserved wetlands.
	1.7 Farms must be located outside the prohibited areas/zone
	as indicated by law.
2. Farm management	2.1 Farm must have and operate according to operational
	manual
	2.2 Measurement of quality in source water according to the
	operation manual
	2.3 Resting and/or preparation of pond before start the next
	crop
	2.4 Stocking of shrimp larvae at the appropriate density
	2.5 Availability of record/ certification/ test report of larval
	health
	2.6 Water filtering system installed to prevent the entering of
	shrimp predators to farm
	2.7 Aerator positioned correctly and operated efficiently
	2.8 Used certified feed and not expire feed. On-site feed
	production must declare list of materials and must not use the
	prohibited materials
	2.9 Efficient feed management
	2.10 Feed stored in the safety place that be able to prevent
	the contamination and maintain quality of feed
	2.11 Routine analysis of water qualities in shrimp culture pond
	2.12 Prevention of predators and disease carriers to entering
	the ponds
	2.13 Routine monitoring of shrimp health
	2.14 In case of poor health, disease should be diagnosed, the
	cause and measure should be made
	2.15 Availability of prevention measure and efficiently disease



	outbreak control plan.		
	2.16 In case of disease outbreak should be inform to the		
	control authority		
3. Use of veterinary drugs,	3.1 Not use banned and unregistered veterinary drugs,		
chemical, hazardous material	chemical, hazardous materials and probiotics drugs		
and probiotics	3.2 If authorized drug or chemical is applied, withdrawal		
	period must be strictly performed or restriction of use		
	according to the instruction		
	3.3 Authorized drugs, chemicals and probiotics stored in an		
	appropriate manner		
4. Effluent and sludge	4.1 Effluent qualities must meet the national effluent standard		
management	for aquaculture farm		
	4.2 Shrimp farm effluent should not be discharged unless it		
	was treated before discharge		
	4.3 Shrimp farm should prevent environmental impact of		
	discharged saline water on freshwater/agricultural area.		
	4.4 Sludge from shrimp farm should not be discharged into		
	public or non-permitted area		
5. Energy and fuel	5.1 Fuel and lubricant should be stored safety and in a		
	responsible manner		
	5.2 Mechanical machine used in farm should be in good		
	condition without leakage of fuel or lubricant in to source		
	water		
	5.3 Lubricant is recommended to disposed or eliminated in a		
	responsible manner.		
	5.4 Safety electricity system should be provided		
6. Garbage and farm sanitary	6.1 Used drug/ chemical containers should be disposed of in a		
	responsible manner in order to prevent contamination		
	6.2 Shrimp farm should provide appropriate hygienic garbage		
	management and pest control		
	6.3 Good hygienic toilet , avoid contamination of domestic		
	sewage into grow-out pond, reservoir and canal		
	6.4 Untreated animal manure must not be used		
	6.5 No pet should be allowed in the production area of the		
	farm		
7. Shrimp harvesting and	7.1 No prohibited chemicals must be used during shrimp		
post-harvest	harvest		
	7.2 Using of authorized chemical in the appropriate manner		
	7.3 Use certified buyer / collector registered with Department		
	of Fisheries		
	7.4 Harvest should be done in a good manner		
8. Employee and worker	8.1 Legal worker employment must be performed		
welfare	8.2 Legal worker wages must be applied.		
	8.3 Shrimp farm is recommended to provide appropriated		
	worker and welfare		
	8.4 Shrimp farm is recommended to provide enough and		
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safety equipments for farm work
8.5 Shrimp farm is recommended to provide adequate training
on work safety practices
9.1 Shrimp farm must not block the traditional access route to
public resources and/or disturb traditional lifestyle
9.2 Shrimp farm is recommended to provide support and assist
to the local community
9.3 Shrimp farmer is recommended to apply to be membership
of group/ club/association which related to the profession
9.4 Shrimp farmer is recommended to participate to seminar
and/or training on related environmental friendly shrimp
culture techniques
10.1 Shrimp fry movement document (FMD) and movement
document (MD)
10.2 Record of veterinary drug, chemical, hazardous materials
and probiotics
10.3 Records of all relevant data of inputs and outputs should
be available for the inspection

Table 1-2: Thai COC

Principle	Criteria
Farm management	
1. Location	1.1 Farms with land title or at least 2 years of renting from land owner/government
	1.2 Farm located outside the mangrove and consider carrying capacity of land
	1.3 Farm located in an area of good-quality water
	1.4 Farm located in an area of good-quality soil for shrimp
	culture
	1.5 Farms not located near potential pollution sources
	1.6 Farm have basic infrastructure and utilities
	1.7 Farm registered with the competent authority
2. Management	2.1 Farm with good layout according to technical requirements
	2.2 Farm maintain water quality, stocking density not exceed
	capacity, use good-quality feed and effective feeding
	management
	2.3 Farm should decrease water exchange rate
	2.4 Farm use fertiliser, limes and chemical in a responsible manner
	2.5 Farm monitor and manage shrimp health
	2.6 Farm position aerator correctly and operate efficiently
	2.7 Farm maintain pone bottom, sludge removal is done
	properly
	2.8 Farm with water filtering system installed to prevent the



	antaring of chrimp produtors to form
	entering of shrimp predators to farm
	2.9 Farm have predator control not harmful to importance
	species for ecological values
3. Stocking density	3.1 Stocking density based on culturing technique, target,
	survival rate and size
	3.2 Stocking density based on larval quality, size and age
	3.3 Stocking density based on pond capacity
4. Feed	4.1 Farm use good-quality feed, freshly produced, and not
	expire
	4.2 Farm store feed properly
	4.3 Farm have efficient feed management
	4.4 Farm uses fresh feed when necessary and with good
	management practices
	4.5 Farm uses medicated feed correctly, when necessary
	4.6 Farm calculates amount of feed given daily and FCR
5. Shrimp health	5.1 Farm monitor shrimp heath and water quality in ponds
	regularly
	5.2 Farm has measures to prevent disease outbreak from
	pond management
	5.3 Farm have measure to prevent diseases spread within farm
6.Drug and Chemical	6.1 Farm sued veterinary drugs and chemicals based on
	instructions, withdrawal period, storage and disposal
	6.2 In case of using harmful chemical, draining water after
	chemical disintegrate
	6.3 Farm record the chemical use
	6.4 Farm stores chemical properly, dispose in a responsible
	manner
	6.5 Farm uses veterinary drugs and chemical used accordance
	with the instructions by government and national standard
7. Wastewater and sludge	7.1 Farm should canals and embankments to reduce erosion
	7.2 Farm should decrease draining of water (wastewater)
	7.3 Farm should use fertiliser only when necessary
•	1 7.3 Lattit stipata ase termiser prim milen neressam
	7.4 Farm should store fuel and lubricant safely and in a
	7.4 Farm should store fuel and lubricant safely and in a responsible manner
	7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge
	7.4 Farm should store fuel and lubricant safely and in a responsible manner7.5 Farm should comply with effluent/sludge discharge standard
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care,
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals 7.8 Farm not discharge water to fresh water and agriculture
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals 7.8 Farm not discharge water to fresh water and agriculture area
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals 7.8 Farm not discharge water to fresh water and agriculture area 7.9 Farm dispose sludge in a responsible manner
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals 7.8 Farm not discharge water to fresh water and agriculture area 7.9 Farm dispose sludge in a responsible manner 7.10 Farm has sanitary systems for workers
	 7.4 Farm should store fuel and lubricant safely and in a responsible manner 7.5 Farm should comply with effluent/sludge discharge standard 7.6 Farm should drain waster out of culturing pond with care, to present sedimentation disturb 7.7 Farm should design wastewater canals not to cause impacts to natural receiving canals 7.8 Farm not discharge water to fresh water and agriculture area 7.9 Farm dispose sludge in a responsible manner



	logislations
	legislations
	7.13 Farm evaluates waste management system and
	continuously improves
8.Harvest	8.1 Farms should have harvesting plan and quick sell for best
	freshness
	8.2 Farm check chemical residues before harvesting
	8.3 Farm ensure no use of prohibited chemicals
	8.4 In case of hiring harvestors, shrimp farms should ensure no prohibited chemicals are used during harvesting
	8.5 Shrimp farms should sell shrimp directly to processors for best freshness
	8.6 Shrimp farms should encourage freshness control and clean ice
9.Socail responsibility	9.1 Farm is recommended to provide support and assist to the local community
	9.2 Farm participates mangrove plantation program, good
	relation/no impacts on local community
	9.3 S Farm supports local community in environmental
	conservation, public health, safety and education
	9.4 Farm/association inform workers their roles and
	organization structure
	9.5 Farms should use local labours
	9.6 Farm pays wage according to labour laws
	9.7 Farm should provide worker welfare and living condition
	9.8 Farm should have farm management policy
10.Training	10.1 Farms have regular group discussion
10.114111119	10.2 Farmer should participate to seminar and/or training on
	related shrimp culture techniques
	10.3 Farms be trained on related laws and regulations on
	shrimp aquaculture
	10.4 Farms responsible for society and environment
11.Traceability	Farm location
11. Haceability	Farm management
	Feed and feeding
	Shrimp health management
	Veterinary drugs and chemicals
	Wastewater and sludge
	Social responsibility
	Group and training
	Accounting, financial and marketing
Hatchery management	T
1. Location	1.1 Hatchery with land title or at least 2 years of renting from
	land owner/government
	1.2 Hatchery located in an area of good-quality water
	1.3 Hatchery not located near potential pollution sources
	1.4 Hatchery have basic infrastructure and utilities



	1.5 Hatchery registered with the competent authority
2.Management	2.1 Hatchery with good layout according to technical
5	requirements
	2.2 Hatchery should decrease water exchange rate
	2.3 Hatchery use fertiliser, limes and chemical in a responsible
	manner
	2.4 Prevention of disease and predators not harmful to
	importance species for ecological values
	2.5 Hatchery have good hygienic and clean with the standard
3. Broodstock	3.1 Checking broodstock health before breeding
3. Broodstock	3.2 Hatchery should be used broodstock from farm culture
	3.3 Broodstock from capture not effect to environmental and
	natural resource
	3.4 Transport broodstock from capture according to technical
	requirements 3.5 Not used drug and chemical before harvest
4 Food	
4. Feed	4.1 Hatchery use good-quality feed, freshly produced, and not
	expire 4.2 Hatchery store food properly
	4.2 Hatchery store feed properly
	4.3 Hatchery should consider to produce feed
	4.4 Hatchery have efficient feed management
	4.5 Hatchery calculates amount of feed given daily and FCR
5. Shrimp health	5.1 Hatchery monitor shrimp heath and water quality in ponds
	regularly
	5.2 Hatchery should culture post-larvae to have a good health
	and free from pathogens
	5.3 Hatchery have withdrawal before harvest
	5.4 Hatchery has measures to prevent disease outbreak from
	culture management
	5.5 Hatchery have measure to prevent diseases spread within
	Hatchery
	5.6 Hatchery should pack and transport post-larvae properly to
	ensure their good health conditions with no pathogens
6.Drug and Chemical	6.1 Hatchery sued veterinary drugs and chemicals based on
	instructions, withdrawal period, storage and disposal
	6.2 In case of using harmful chemical, draining water after
	chemical disintegrate
	6.3 Hatchery record the chemical use
	6.4 Hatchery stores chemical properly, dispose in a responsible
	manner
	6.5 Hatchery uses veterinary drugs and chemical used
	accordance with the instructions by government and national
	standard
7.Wastewater and sludge	7.1 Hatchery should decrease draining of water (wastewater)
7. Wastewater and sludge	7.1 Hatchery should decrease draining of water (wastewater) 7.2 Hatchery should consider using natural foods, apply



	management to provent remaining found and absorbed continue
	management to prevent remaining feed and chemical residues
	7.3 Hatchery should store Drug and chemical safely and in a responsible manner
	7.4 Hatchery should comply with effluent/sludge discharge
	standard
	7.5 Hatchery should drain waster out of culturing pond with
	care, to present sedimentation disturb
	7.6 Hatchery should design wastewater canals not to cause
	impacts to natural receiving canals
	7.7 Hatchery not discharge water to fresh water and
	agriculture area
	7.8 Hatchery has sanitary systems for workers
	7.9 Farm dispose wastes and sewage correctly
	7.10 Hatchery has management system accordance with
	legislations
	7.11 Hatchery evaluates waste management system and
	continuously improves
8. Socail responsibility	8.1 Hatchery is recommended to provide support and assist to
	the local community
	8.2 Hatchery participates mangrove plantation program, good
	relation/no impacts on local community
	8.3 S Hatchery supports local community in environmental
	conservation, public health, safety and education
	8.4 Hatchery/association inform workers their roles and
	organization structure
	8.5 Hatchery should use local labours
	8.6 Hatchery pays wage according to labour laws
	8.7 Hatchery should provide worker welfare and living
	condition
	8.8 Hatchery should have Hatchery management policy
9.Training	9.1 Hatchery have regular group discussion
	9.2 Hatchery should participate to seminar and/or training on
	related shrimp culture techniques
	9.3 Hatchery be trained on related laws and regulations on
	shrimp aquaculture
	9.4 Hatchery responsible for society and environment
10.Traceability	Hatchery location
	Hatchery management
	Broodstock
	Feed and feeding
	Shrimp health management
	Veterinary drugs and chemicals
	Wastewater and sludge
	Social responsibility
	Group and training
	Accounting, financial and marketing
	1



Table 1-3: ACC - Hatchery

Principle	Criteria
SOCIAL	1. Hatchery has property right (land, water, construction,
	operation) and regulatory compliance
	2. Hatchery shall not deny local communities access to public
	mangrove areas, fishing grounds or other pubic resources
	3. Farm shall comply with local and national labour laws
	(worker safety, compensation, living conditions)
ENVIRONMENT	4. Hatchery shall not be located in mangrove, not operated to
	cause damage to wetland or biodiversity
	5. Hatchery shall establish health monitoring and control
	procedure to minimise risk of disease
	6. Hatchery shall monitor effluent
	7. Hatchery shall store fuel, lubricants and chemicals and
	dispose in a responsible manner
	8. Hatchery shall not release untreated human sewage into
	local ecosystem without proper treatment
FOOD SAFETY	9. Hatchery shall not use banned antibiotics, drugs and other
	chemical compounds (no prophylactic purpose)
TRACEABILITY	10. Hatchery -Product traceability
	tank identification number
	stocking date
	species
	quantity of larvae stocked
	source of broodstock (wild, domesticated, SPF)
	antibiotic and drug use
	manufacturer and lot number of each feed used
	harvest date
	harvest quantity
	receiving farm or purchaser



Table 1-4: ACC - Farm

Principle	Criteria
SOCIAL	1. Farm has property right (land, water, construction,
	operation) and regulatory compliance
	2. Farms shall not deny local communities access to public
	mangrove areas, fishing grounds or other public resources
	3. Farm shall comply with local and national labour laws
	(worker safety, compensation, living conditions)
ENVIRONMEN	4. Farms shall not be located in mangrove, not operated to
	cause damage to wetland or biodiversity
	5. Farm shall monitor effluent
	6. Farms shall contain sediment from ponds and not cause
	salinization or ecological nuisance in surrounding land and
	water
	7. Farm construction and operations shall not cause soil and
	water salinization or groundwater depletion
	8. Farms shall not use wild post-larvae and comply with
	regulations on imported seed stock
	9. Farms shall store fuel, lubricants and chemicals and dispose
	in a responsible manner
FOOD SAFETY	10. Farms shall not use banned antibiotics, drugs and other
	chemicals
	11. Farms shall treat human waste and untreated animal
	manure in septic tanks and not contaminate areas
	12. Farms shall harvest and transport with temperature control
	and minimise physical damage and contamination
TRACEABILITY	13. Farm - Product traceable to pond and in/outs of origin
	(Trace Register online system)
	pond identification number
	pond area
	stocking date
	quantity of post-larvae stocked
	source of post-larvae
	antibiotic and drug use
	herbicide, algicide and other pesticide use
	manufacturer and lot number of each feed used
	harvest date
	harvest quantity
	sulfite use and protocol
	processing plant or purchaser
	Francis Piante of Paranage.



Table 1-5: ACC - Feed mill

Principle	Criteria
SOCIAL	1. Feed mill shall comply with local/national laws and
	environmental regulations
	2. Feed mill shall comply with local and national labour laws
	(worker safety, compensation, living conditions)
ENVIRONMENT	3. Feed mills shall reduce dependence on wild fisheries and
	obtain fishmeal and oils from sustainable sources
	4. Feed mill shall label, store, use and dispose fuel, lubricants
	and chemicals and dispose in a responsible manner
	5. Feed mill shall dispose refuses in a responsible and bio
	secure manner
FOOD SAFETY	6. Feed mills shall have current, systematic, documented
	process controls with good manufacturing practice to
	minimise food safety hazards
TRACEABILITY	7. Feed mill - Product traceable to pond and in/outs of origin
	(Trace Register online system)
	INGREDIENTS
	ingredient type
	date received
	shipper's name, address and contact details
	supplier's name, address and contact details
	unloading assignment
	bulk quantity or number of bags
	bag size
	packaging type
	unique lot number
	quality comments
	receiver's signature
	expiration date
	MEDICATED FEED
	drug name, including potency
	date received
	quantity
	supplier's name
	supplier's code for drug
	supplier's lot or code number
	return of any damaged or unacceptable drugs
	FINISHED PRODUCT
	manufacturing date
	ingredient sources including all additives
	feed type mixed
	formulation details
	processing conditions



unique lot number
actual yield
mixing personnel
bin assignment
drug inclusion
sequencing and flushing
dispatch date
name, address and contact details for transporters
name, address and contact details for destination/purchaser
misformulated, damaged or returned feed status esp.
medicated feed

Table 1-6: ACC - Processing plant

Principle	Criteria
SOCIAL	1. Processing plant shall comply with local/national laws and
	environmental regulations
	2. Processing plant shall comply with local and national labour
	laws (worker safety, compensation, living conditions)
ENVIRONMENT	3. Processing plant dispose of process water and sewage in a
	responsible manner
	4. Processing plant shall label, store, use and dispose fuel,
	lubricants and chemicals and dispose in a responsible manner
	5. Processing plant shall dispose refuses in a responsible and
	bio secure manner
FOOD SAFETY	6. Processing plant shall have HACCP plan process control to
	control food hazards and ensure product safety
PRODUCT TESTING	7. Processing plant - Random samples of finished products
	shall be analysed for bacterial contamination and antibiotic
	residues by both processing plant and third-party laboratories
TRACEABILITY	8. Processing plant - Product traceable
	TRCEABILITY DATA
	farm name
	BAP-certified farm identification
	Species
	Farm lot number
	BAP-certified processing plant identification
	Date and time of product reception at plant
	Plant lot number
	Finished lot weight
	Product form and count
	BUYER DATA
	Buyer name
	ACC buyer identification
	Lot quantity shipped



Shipping date
Invoice/transfer number

Table 1-7: organic, Naturland

Principle	Criteria
PRINCIPLES OF MANAGEMENT	
Selection of site, interaction with surrounding ecosystems	1.1 By selection of site and the method of management of the farm, the surrounding ecosystems shall not be adversely affected
	1.2. The farmer shall reach an agreement with the representatives of neighbouring local and regional authorities to ensure free access to the natural water courses surrounding the farm
	1.3 Design and management of the farm areas it shall be ensured that the water bodies in-side the operation retain their ecological functions
	1.4. While protecting the farm areas from predatory not harming the animals physically shall be preferred (e.g. nets, dummy raptors)
	1.5. Preference is to be given to the use of renewable energy resources and recycle materials
	1.6. The farm produces a sustainability plan
2. Species and origin of stock	2.1. As stock, species naturally occurring in the region shall be preferred
	2.2. Where suitable, polyculture shall be preferred
	2.3. Organic stock
3. Breeding, hatchery management	3.1 Hatchery - The respective provisions for grow-out operations apply correspondingly.
	3.2 Hatchery -The use of hormones, even from the same species, is not allowed.
4. Design of holding systems, water quality, stocking	4.1. The husbandry conditions must enable the animal to behave in a way natural to the species
density	4.2. For construction and management are not causing any injurious effects on the organisms or the environment
5. Health and Hygiene	5.1 Use of conventional medicine is only permitted in vertebrates and after detailed diagnosis and remedial prescription by a veterinarian
	5.2. Permitted treatments, also as prophylactics or routine (within the framework of statutory regulations)
6. Oxygen Supply	6.1 The basis for aquaculture operation shall form the natural, physical conditions of water body (aeration not used to raise density above limit)
7. Organic Fertilizing	7.1 Organic fertilizer can be used to cultivate water bodies
	7.2 Organic fertilising allowed only if combined with other forms of animal husbandry or crop plantations



	Todas and the second second
8. Feeding	8.1. For certain culture systems an upper limit for the
	application quantity feed/area can be determined
	8.2. Type, quantity and composition of feed must take into
	account the natural feeding methods of the concerned animal
	species
	8.3. All the feed stuffs must be produced in accordance with
	Naturland standards
	8.4. Feed from genetically altered organisms or their products
	is not permitted
	8.5 Feed ingredients for the culture of carnivorous species with
	higher protein requirements
	8.6.Feeding of natural pigments (e.g. in the form of shrimp
	shells or Phaffia yeast) is permitted
	8.7. Synthetic antibiotic and growth-enhancing substances as
	well as other synthetic feed additives are not permitted
9. Transport, slaughtering	9.1. Transport and slaughtering must be done as quickly and
and processing	humanely as possible in order to spare the animals
	unnecessary suffering
	9.2. Maintenance of the cold chain from the point of
	slaughtering up to the sales point must be strictly observed
	9.3. The cleaning of factory rooms, devices and machines must
	ensure a perfect hygiene along with an as high as possible
	ecofriendliness
10. Smoking	10.1 Customary smoking techniques are permitted, but not
J	black smoke
NATURLAND: SUPPLEMENTAR	RY FOR THE POND CULTURE OF SHRIMP
1. Site selection, protection	1.1 Not permit to remove mangrove for pond construction
of mangrove	1.2 Former farms located in mangrove not more than 50% of
S	the area can convert to organic shrimp farm
	1.3 Former mangrove area must be rein stored to at least 50%
	during 5 years
2. Protection of ecosystem -	2.1 Effluent water quality monitoring
farm area and surrounding	2.2 Minimising outflow of nutrient and suspended solid during
i anni anda anna dan dan dan anna	harvesting
	2.3 No salinization/scattered salt dust to adjacent agricultural
	activities
	2.4 At least 50% of total dyke surface shall be covered by
	plants
	2.5 Documentation on foraging predators, estimated harvest
	loss and type of preventive measures shall be kept
	2.6 Unwanted fish regulated by mechanical means or
	application of natural/herbal ichtyocides (e.g. saponine)
i e	application of natural/nerval lentyocides (e.g. saponine)
	2.7 Prevent release of toxic or harmful substances in nonde
	2.7 Prevent release of toxic or harmful substances in ponds,
2 Species and origin of stack	channels or banks
3. Species and origin of stock	•



	used
4. Hatchery management	4.1 Hatchery - No use of prohibited antibiotics,
	chemotherapeutics
	4.2 Hatchery - Alimentation of parent stock and larvae and
	culture of feed (e.g. Artemia, algae in hatcheries according to
	principle or organic aquaculture
	4.3 Hatchery - No physical manipulation of animals to obtain
	eggs
	4.4 Hatchery - Decrease aeration, artificial light and heat in
	culture of bloodstock and larvae as much as possible
5. Pond design, water quality,	5.1 Adequate pond design to support natural foraging
stocking density	behaviour of shrimp
	5.2 Lowest possible water exchange rate to decrease energy
	consumption and nutrient loss
	5.3 Maximum stocking density is 15 post-larvae/m2
6. Health and hygiene	6.1 Prevent stress (e.g. control origin of larvae, monitor water
	quality)
	6.2 Monitor shrimp health status and documented
	6.3 No treatment with antibiotics, chemotherapeutic
	6.4 Pond bottom gives enough time to dry
7. Fertilizing of pond	7.1 Permit supplementary doses of phosphate but the over
	quantity is limited by effluent's quality
8. Feeding	8.1 Reduce external feed by increasing natural feed production
	in ponds
	8.2 Monitor feed intake and documented
9. Harvesting and processing	9.1 At least 3 days, feeding and fertilising shall be stopped for
	adequate period before harvesting
	9.2 No use of metabisulfite during harvest procedure
	9.3 Reuse of shrimp heads and other processing
	residues/trimming (feeding to same species not allowed)
3. Social responsibility	
1. Human rights/They must	
com-ply at the minimum with	
the local legal requirements	
2. Forced labour/The	
operations commit	
themselves to rejecting	
forced labour	
3. Freedom of association,	
access to trade unions	
4. Equal treatment and	
opportunities	
5. Child labour/No children	
may be employed on farms.	
Children may work on the	
farms of their own families or	



a neighbouring farm	
6. Health and safety/All workers, employees and their families shall have access to drinking water, food, accommodation and basic medical care.	
7. Employment conditions	7.1. Contracts/All workers receive a written contract of employment describing the basic conditions 7.2. Equal treatment/The different kinds of employment shall
	in no case result in the unequal treatment of any workers
	7.3. Wages/Workers shall be paid at least the official national minimum wage or the relevant industry standard
	7.4. Payment in kind/If they so choose, workers may receive part of their wage in kind for services such as housing
	7.5. Working hours/To permit flexibility and overtime in the peak season (e. g. harvest), an annual limit of working hours
	7.6. Social benefits/The employer ensures basic coverage for maternity, sickness and retirement
	7.7. Further education/The unit offer its employees the possibility of further education and professional training

Table 1-8: GLOBALG.A.P.

Principle	Criteria
ALL FARM BASE	
RECORD KEEPING AND	AF . 1 . 1 All records requested kept for a minimum period of
INTERNAL SELF-ASSESSMENT,	time of two years
INTERNAL INSPECTION	AF . 1 . 2 Responsibility to undertake a minimum of one
	internal self-assessment per year
	AF . 1 . 3 effective corrective actions taken as a result of non-
	conformances detected during the internal self-assessment
SITE HISTORY AND SITE	
MANAGEMENT	
Site History	AF . 2 . 1 . 1 A recording system established for each unit of
	production
	AF . 2 . 1 . 2 A reference system for each field, orchard,
	greenhouse, yard
Site Management	AF . 2 . 2 . 1 A risk assessment for new agricultural sites
	AF . 2 . 2 . Management plan been developed setting out
	strategies to minimise all identified risks
WORKERS HEALTH, SAFETY	
AND WELFARE	
Risk Assessments	AF . 3 . 1 . 1 Farm have a written risk assessment for safe and
	healthy



	T
	AF . 3 . 1 . 2 Farm have a written health, safety and hygiene
	policy and procedures including issues
Training	AF . 3 . 2 . 1 There a record kept for training activities
	AF . 3 . 2 . 2 All workers handling and/or administering
	veterinary medicines defined in the risk assessment
	AF . 3 . 2 . 3 All workers received adequate health and safety
	training
	AF . 3 . 2 . 4 Always an appropriate number of persons (at least
	one person) trained in first aid present on each farm
	AF . 3 . 2 . 5 Farm have documented hygiene instructions
	AF . 3 . 2 . 6 All persons working on the farm received basic
	hygiene training
	AF . 3 . 2 . 7 The farm's hygiene procedures implemented
	AF . 3 . 2 . 8 Visitors aware of the relevant procedures on
	personal safety and hygiene
Hazards and First Aid	AF . 3 . 3 . 1 Accident and emergency procedures exist, are
	they visually displayed and communicated
	AF . 3 . 3 . 2 potential hazards clearly identified by warning
	signs
	AF . 3 . 3 Safety advice available/accessible for substances
	hazardous to worker
	AF . 3 . 3 . 4 First Aid kits present at all permanent sites
Protective	AF . 3 . 4 . 1 Workers (including subcontractors) equipped with
Clothing/Equipment	suitable protective clothing in accordance with legal
	requirements
	AF . 3 . 4 . 2 Protective clothing cleaned after use and stored
Worker Welfare	AF . 3 . 5 . 1 member of management clearly identifiable as
	responsible for workers health
	AF . 3 . 5 . 2 Communication meetings take place between
	management and workers
	AF . 3 . 5 . 3 Information available that provide an accurate
	overview over all workers
	AF . 3 . 5 . 4 Workers have access to clean food storage areas
	AF . 3 . 5 . 5 Living quarters habitable and have the basic
	services and facilities
Subcontractors	AF . 3 . 6 . 1 Is all the relevant information available on farm
WASTE AND POLLUTION	
MANAGEMENT, RECYCLING	
AND RE-USE	
Identification of Waste and	AF . 4 . 1 . 1 All possible waste products and sources of
Pollutants	pollution been identified in all areas of the business
Waste and Pollution Action	AF . 4 . 2 . 1 A documented farm waste management plan to
Plan	avoid or reduce wastage and pollution
	AF . 4 . 2 . 2 This waste management plan been implemented
	AF . 4 . 2 . 3 The farm and premises clear of litter and waste to
	avoid establishing a breeding ground for pests and diseases
	avoid establishing a preeding ground for pests and diseases



	AF . 4 . 2 . 4 Premises have adequate provisions for waste disposal
ENVIRONMENT AND	
CONSERVATION	
Impact of Farming on the	AF . 5 . 1 . 1 Producer have a management of wildlife and
Environment and Biodiversity	conservation plan
,	AF . 5 . 1 . 2 Producer considered how to enhance the
	environment for the benefit of the local community
	AF . 5 . 1 . 3 Policy compatible with sustainable commercial
	agricultural production
	AF . 5 . 1 . 4 The plan include a baseline audit to understand
	existing animal and plant diversity
	AF . 5 . 1 . 5 the plan include action to avoid damage and
	deterioration of habitats
	AF . 5 . 1 . 6 The plan include activities to enhance habitats and
	increase biodiversity
Unproductive Sites	AF . 5 . 2 . 1 The conversion of unproductive sites to
·	conservation areas for the encouragement of natural flora and
	fauna
Energy Efficiency	AF . 5 . 3 . 1 The producer show monitoring of energy use on
,	the farm
COMPLAINTS	AF . 6 . 1 There a complaint procedure available relating to
	issues covered
	AF . 6 . 2 The complaints procedure ensure that complaints are
	adequately recorded
TRACEABILITY	AF . 7 . 1 All producers have a documented recall procedure to
	manage the withdrawal of registered products
AQUACULTURE BASE	
SITE MANAGEMENT	
Management and	AB . 1 . 1 . 1 Quality manual
Documentation	AB . 1 . 1 . 2 Organizational structure
	AB . 1 . 1 . 3 Documented internal audit procedure
	AB . 1 . 1 . 4 Contingency plan
	AB . 1 . 1 . 5 Risk assessment for animal welfare
	AB . 1 . 1 . 6 Genetically Modified -GM (transgenic) - fish
	prohibited
Site Management	AB . 1 . 2 . 1 Water quality does not compromise food safety
	and animal health & welfare
	AB . 1 . 2 . 2 Farms and other facilities maintained in good
	repair
	AB . 1 . 2 . 3 Paints, preservative and other chemical compound
	not use on surface
	AB . 1 . 2 . 4 Precautions to prevent erosion
	AB . 1 . 2 . 5 Water supply and effluent are not mixed
	AB . 1 . 2 . 6 Canal and embankments constructed to limited
	adverse effect of high floods levels
	daverse effect of flight hoods levels



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	AB . 1 . 2 . 7 Vegetative buffer zones and habitat corridors
	AB . 1 . 2 . 8 Do not drain effluent into stagnant water or cause erosion
	AB . 1 . 2 . 9 Design and construction of site support the
	biodiversity plan
	AB . 1 . 2 . 10 Infrastructure support in case of infectious
	disease outbreak
	AB . 1 . 2 . 11 Waste management system
	AB . 1 . 2 . 12 Written procedure for pond routine dry out
Site Entry	AB . 1 . 3 . 1 Restrict site entry
	AB . 1 . 3 . 2 Prohibited and/or unauthorized signs
	AB . 1 . 3 . 3 Work instruction to control persons, vehicles and
	materials into farms
	AB . 1 . 3 . 4 Hand wash and other disinfection devices
	AB . 1 . 3 . 5 Instruction displayed at wash hands
CHEMICALS	
Chemical Storage	AB . 2 . 1 . 1 Chemicals stored in accordance with the label
	instructions and legislation
	AB . 2 . 1 . 2 Emergency information with corresponding
	facilities for workers
	AB . 2 . 1 . 3 Limited chemical access to trained workers
	AB . 2 . 1 . 4 Accident procedure plan
	AB . 2 . 1 . 5 Chemicals stored in their original packaging
	AB . 2 . 1 . 6 Chemical store shelves made of non-absorbent material
	AB . 2 . 1 . 7 Chemical store able to retain spillage
	AB . 2 . 1 . 8 Special facilities for measuring and/or mixing of
	chemicals
	AB . 2 . 1 . 9 Emergency facilities to deal with operator
	contamination
	AB . 2 . 1 . 10 Documented chemical inventory
	AB . 2 . 1 . 11 Chemical safety data sheet
	AB . 2 . 1 . 12 Powders stored on shelves above liquids
Empty Containers	AB . 2 . 2 . 1 Empty chemical containers not re-used
	AB . 2 . 2 . 2 Disposal of empty container that avoids exposure
	to humans and animals
	AB . 2 . 2 . 3 Use official collection and disposal systems
	AB . 2 . 2 . 4 Empty containers kept secure until disposal
	AB . 2 . 2 . 5 Local regulations regarding disposal of containers
	and packaging
	AB . 2 . 2 . 6 Waste disposal by certified waste contractor
Transport	AB . 2 . 3 . 1 Conditions of chemical containers assessed before
	movement
	AB . 2 . 3 . 2 Harmful chemicals not transported together with
	people
PEST CONTROL	AB . 3 . 1 Control risk of pest infestation in buildings



	AB . 3 . 2 Detailed records of pest control inspections
	AB . 3 . 3 Prevent ingress of animal pests
OCCUPATIONAL HEALTH	and the second s
AND SAFETY	
Training	AB . 4 . 1 . 1 Training person responsible for decision-making
	on chemical use
	AB . 4 . 1 . 2 Training workers on hygiene standards
Health and Safety	AB . 4 . 2 . 1 Workers have access to toilets, eating facilities and
,	potable water
	AB . 4 . 2 . 2 Diving operations carried out in accordance with
	relevant legislation
	AB . 4 . 2 . 3 Workers provided with and sign for a Health &
	Safety Guide
	AB . 4 . 2 . 4 Workers aware of the contingency procedures
Legislative Framework	AB . 4 . 3 . 1 Farm operated in accordance with all applicable
	legislations
	AB . 4 . 3 . 2 All responsible persons able to explain food safety,
	animal welfare, and environmental legislations
	AB . 4 . 3 . 3 Registration farm with competent authority
FISH WELFARE,	
MANAGEMENT AND	
HUSBANDRY	
Sourcing, Identification and	AB . 5 . 1 . 1 Registered products traceable back to registered
Traceability	farms
	AB . 5 . 1 . 2 Fish traceable to the farm of hatching
	AB . 5 . 1 . 3 Eggs and/or seedlings certified according to
	legislative requirements
	AB . 5 . 1 . 4 Recorded and traceable movements of fish
	between sites
	AB . 5 . 1 . 5 Maintained movement records
	AB . 5 . 1 . 6 All fish identified (on a batch level) to a specific
	batch
	AB . 5 . 1 . 7 Visual mechanism identification used to identify
	batches of fish
	AB. 5.1.8 Fish spent their last six months on registered farm
Fish Hoolth 9 Welfers	AB. 5.1.9 Fish spent their entire life on approved farms
Fish Health & Welfare	AB. 5.2.1 History and current overview of fish health status
	AB . 5 . 2 . 2 Producers demonstrate understanding of hygiene
	practices AR 5 2 3 Votorinary health plan
	AB . 5 . 2 . 3 Veterinary health plan AB . 5 . 2 . 4 Workers familiar with Veterinary health plan
	AB . 5 . 2 . 5 Pre-harvest instructions for veterinary medicine
	known
	AB . 5 . 2 . 6 Notify the relevant competent authority of any
	disease
	AB . 5 . 2 . 7 Workers aware of contingency procedure
i	Ab. 3. 2. 7 Workers aware or contingency procedure



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	AB . 5 . 2 . 8 Monitoring weight and size of fish regularly
	AB . 5 . 2 . 9 Correct feeding quantities used
	AB . 5 . 2 . 10 Stocking density not exceed the maximum load
	AB . 5 . 2 . 11 Water quality monitoring program
	AB . 5 . 2 . 12 Fish treated and handled to protect them from
	pain, stress, injury and disease
Medicines	AB . 5 . 3 . 1 Use approved medicines
	AB . 5 . 3 . 2 Demonstrate compliance regarding Maximum Residue Limit
	AB . 5 . 3 . 3 Not use natural, synthetic hormones or antibiotic agents
	AB . 5 . 3 . 4 ISO 17025 accredited, laboratory performs regular
	sample tests
	AB . 5 . 3 . 5 Medicines disposed in a manner agreed by
	veterinarians
Medicine Records	AB . 5 . 4 . 1 Recorded legal medicine purchase
	AB . 5 . 4 . 2 Visual means use as identification for fish treated
	with medicines
Vaccination Procedures and	AB . 5 . 5 . 1 All used in the vaccination not to cause physical
Treatments	damage and minimal stress
	AB . 5 . 5 . 2 Company procedure for vaccination exist and is
	followed
	AB . 5 . 5 . 3 Use approved vaccines
	AB . 5 . 5 . 4 Trained people for vaccination
Mortality	AB . 5 . 6 . 1 Mortality inspection
	AB . 5 . 6 . 2 Contingency plan for severe disease episode
	AB . 5 . 6 . 3 Plan for the safe removal of sick and dead fish
	AB . 5 . 6 . 4 All mortalities recorded
Fish Holding Area	AB . 5 . 7 . 1 Holding areas maintained in a clean and hygienic
	AB . 5 . 7 . 2 Nets in used tagged and maintained in good
	condition
	AB . 5 . 7 . 3 Net mesh size prevent gilling of small fish
Fasting, Harvesting and	AB . 5 . 8 . 1 Fish fasted before slaughter
Transport	AB . 5 . 8 . 2 Maximum fasting time for fish welfare set by
	recognized authorities or by customer
	AB . 5 . 8 . 3 Harvesting and transport undertaken in a way that
	does not to compromise food safety
Machinery and Equipment	
	AB . 5 . 9 . 1 Minimize the risk of the fish being harmed or
	AB . 5 . 9 . 1 Minimize the risk of the fish being harmed or escaping into the environment
	escaping into the environment
	escaping into the environment AB . 5 . 9 . 2 Recorded machinery and equipment of calibration
	escaping into the environment AB . 5 . 9 . 2 Recorded machinery and equipment of calibration and maintenance
	escaping into the environment AB . 5 . 9 . 2 Recorded machinery and equipment of calibration and maintenance AB . 5 . 9 . 3 Recorded machinery and equipment of cleaning
	escaping into the environment AB . 5 . 9 . 2 Recorded machinery and equipment of calibration and maintenance AB . 5 . 9 . 3 Recorded machinery and equipment of cleaning and disinfecting



	AP F O COverson complementation system
	AB. 5. 9. 6 Oxygen supplementation system
	AB . 5 . 9 . 7 Outlet and inlet screens inspected
	AB . 5 . 9 . 8 All equipments well constructed and not cause
	damage to fish
	AB . 5 . 9 . 9 Movement of stock made in purpose built
	containers with oxygenation equipment
	AB . 5 . 9 . 10 Separation or disinfection of equipment
AQUACULTURE FEED	
General	AB . 6 . 1 . 1 Suitable diet for the species farmed
	AB . 6 . 1 . 2 Compound feed obtained from an appropriate
	source
Feed Records	AB . 6 . 2 . 1 Batches of fish feed traceable from the feed
	manufacturer
	AB . 6 . 2 . 2 Documentary record of feed suppliers
	AB . 6 . 2 . 3 Declaration of feed constituents from feed
	suppliers
	AB . 6 . 2 . 4 List of all antibiotics, pigments, antioxidants used
	in feed
	AB . 6 . 2 . 5 Feed consumed before shelf life expires
	AB . 6 . 2 . 6 Regular testing on feed contaminants
Storage of Aquaculture Feeds	AB . 6 . 3 . 1 Feed stored and produced in accordance with
	good practice
	AB . 6 . 3 . 2 Separate bin for excess medicated feed
ENVIRONMENTAL AND BIODIVERSITY MANAGEMENT	
Environmental Management	AB . 7 . 1 . 1 Environmental and biodiversity policy
Liviloillientai ivialiagement	
	AB . 7 . 1 . 2 Continuously update EIA and ERA AB . 7 . 1 . 3 Environmental and biodiversity Management Plan
	AB . 7 . 1 . 4 Environment Contingency Plan established and
	covers action
	AB . 7 . 1 . 5 Only approved anti-foulant agents used
	AB . 7 . 1 . 6 EIA/EMP an action plan and precautions in place
	AB . 7 . 1 . 7 Competent authorities and local communities
	been informed when salinization
Enorgy Efficiency	
Energy Efficiency	AB . 7 . 2 . 1 Measures to optimize energy use and minimize
Masta	AB . 7 . 3 . 1 All human solid wastes from toilets collected and
Waste	
Nitroto and Dhaarbata Lavel	disposed without contamination
Nitrate and Phosphate Levels	AB . 7 . 4 . 1 N, P levels limits in accordance with national and
in Drain Water	international legislation
	AB . 7 . 4 . 2 Organic wastes stored to reduce the risk of contamination of the environment
Í	LCONTACTION OF THE ENVIRONMENT
Duadatan Cautual	
Predator Control	AB . 7 . 5 . 1 Predator control to prevent unnecessary wildlife
Predator Control	AB . 7 . 5 . 1 Predator control to prevent unnecessary wildlife destruction
Predator Control Escapes and Non-Indigenous	AB . 7 . 5 . 1 Predator control to prevent unnecessary wildlife



Species	
WATER USAGE AND	
DISPOSAL	
General	AB . 8 . 1 . 1 Water abstraction and discharge meet the requirements
	AB . 8 . 1 . 2 Farm have environmental and biological
	parameter as guideline
	AB . 8 . 1 . 3 Water quality monitored of discharged water and/or recipient water body
	AB . 8 . 1 . 4 Suspended solids in the recipient water body addressed in EIA/EMP
	AB . 8 . 1 . 5 Sludge disposed of in an appropriate manner
	AB . 8 . 1 . 6 Samples taken in sediment of the recipient water
	body for diversity of macrozoobenthos
	AB . 8 . 1 . 7 Fresh ground water not used to lower salt
	concentration
	AB . 8 . 1 . 8 Minimize use of water
	AB . 8 . 1 . 9 Impact of emissions through the water on
	biodiversity monitored in EMP
Supply / Quality of Ice	AB . 8 . 2 . 1 Ice produced from potable water according to
	applicable legislative requirements
	AB . 8 . 2 . 2 Human-food grade of processing aids/additive to
	water used in ice making
CAGE PRODUCTION	AB . 9 . 1 Bottom of net never touches bottom of water body
SAMPLING AND TESTING	AB . 10 . 1 Sampling programme based on likely contaminant
	AB . 10 . 2 Duplicate samples taken and held for independent analysis
	AB . 10 . 3 Laboratory used for testing accredited to ISO 17025
	or equivalent standard
	AB . 10 . 4 Laboratory test results traceable to the specific batch
SHRIMP SPECIES MODULE	- Succin
HATCHERIES AND	
NURSERIES	
Broodstock sources	SP . 1 . 1 . 1 No wild sourced broodstock
	SP . 1 . 1 . 2 Selected stocks of disease free
	SP . 1 . 1 . 3 Broodstock purchased from certified suppliers
	SP . 1 . 1 . 4 Broodstock held quarantine until their disease
	status is verified and for a minimum of 20 days
	SP . 1 . 1 . 5 Broodstock screened for general health, is
	screened for known virus
Nauplii and post larvae	SP . 1 . 2 . 1 No wild sourced post larvae
sources	SP . 1 . 2 . 2 Nauplii and post larvae purchased from certified
	hatchery
	SP . 1 . 2 . 3 Monitor improvement of domestication process of
	breeding program



	SP . 1 . 2 . 4 Nauplii or post larvae provide analytical tests
	certificates
	SP . 1 . 2 . 5 Import can certificates demonstrate that they
	comply to health & disease free
	SP . 1 . 2 . 6 Prevent accidental release of hatchery stock
	SP . 1 . 2 . 7 Registration of all disease occurrences during the
	past two years
Hatchery Water supply	SP . 1 . 3 . 1 Incoming water disinfected to destroy pathogens
HUSBANDRY ON THE FARM	
Frequency of Mortality	
Inspection	SP . 2 . 1 . 1 Mortality inspection
Hygiene and pest control	SP . 2 . 2 . 1 Al in all out
	SP . 2 . 2 . 2 Implementation of the policy mentioned in SP.2.1
FEED AT HATCHERIES	SP . 3 . 1 Certified free of pathogens in raw unpasteurized or
	live feed
	SP . 3 . 2 Fresh or frozen feed of animal origin certified at least
	of WSSV, TSV and YHV
HARVESTING	
Method of packing/dispatch	SP . 4 . 1 . 1 Temperature of the shrimp at harvesting reduced
	as quickly
	SP . 4 . 1 . 2 Shrimps protected to prevent heat, losses and
	cross contamination
	SP . 4 . 1 . 3 Shrimps placed in clean and disinfected bins and
	ice added
Labelling / Traceability of	SP . 4 . 2 . 1 Traceability of the harvested pond maintained up
Harvested shrimp	to the process line
	SP . 4 . 2 . 2 Bin individually labelled to ensure traceability
	SP . 4 . 2 . 3 Traceability of a batch of shrimp possible from the
	packing case back to the broodstock
	SP . 4 . 2 . 4 Sites of the aquatic production process
	geographically described
MANGROVE, PROTECTED	SP . 5 . 1 New pond not been established within a designated
AREA AND OTHER HIGH	national Protected Area
CONSREVATION VALUE	SP . 5 . 2 New pond, farm site or related facilities not been
AREAS	established (before April 2008)
	SP . 5 . 3 Farms established between May 1999 and April 2008,
	show rehabilitating area
	SP . 5 . 4 Management and restoration, retiring non-compliant
	ponds areas above the inter-tidal zone
	SP . 5 . 5 Mangroves removed for allowable purposes
	SP . 5 . 6 control seepage and avoid contaminations of aquifers
	and surface fresh water bodies
	SP . 5 . 7 Measures taken to control seepage and avoid
	contaminations
	SP . 5 . 8 Rehabilitation plan
SOCIAL CRITERIA	SP . 6 . 1 Social Annex of shrimp farming accessible via the



	GLOBALGAP data base
SOCIAL CRITERIA	1
LEGISLATIVE AND	
GOVERNACE	
Self-declaration social	
practices	
Worker's Rights	SC 1 . 2 . 1 Responsibility for workers' health, safety and good
S	social practice
	SC 1 . 2 . 2 Records that provide an accurate overview of all
	employees
	SC 1 . 2 . 3 Copies of working contracts
	SC 1 . 2 . 4 Time recording system that shows daily working
	time
	SC 1 . 2 . 5 Working hours and breaks of the individual worker
	indicated in the time records
	SC 1 . 2 . 6 No employ- forced labour
	SC 1 . 2 . 7 Representative to represent the interests of the
	staff to the management
	SC 1 . 2 . 8 Workers have the freedom to join labour
	organization
	SC 1 . 2 . 9 Complain form for employees and affected
	communities
	SC 1 . 2 . 10 Two-way communication meeting between
	manager and workers
	SC 1 . 2 . 11 Minors employed on the farm according to local
	and national legislation
	SC 1 . 2 . 12 All children living on the farm have access to
	primary school education
	SC 1 . 2 . 13 Pay slips document the conformity of payment
	with at least legal regulations
	SC 1 . 2 . 14 Farm pay a living wage according to UNDP
	statistics
	SC 1 . 2 . 15 Employment conditions comply with equality
	principles
SOCIAL ENVIRONMENT	SC 2 . 1 Owner has a legal land title to the land where
	aquaculture takes place
	SC 2 . 2 Participatory social impact assessment and sufficient
	compensation
	SC 2 . 3 In case of a social conflict, is mediation available
	SC 2 . 4 Provision to compensate impacts on workers and land
	on exit or bankruptcy of farm operation
	SC 2 . 5 Fair and transparent contract farming arrangements



Appendix 2: Questionnaires

แบบสอบถามเรื่องระบบรับรองฟาร์มกุ้ง หมายเลขกำกับแบบสอบถาม							
ข้อมูลผู้สัมภาษณ์และผู้ให้สัมภาษณ์:	ขนาดฟาร์ม 🗆	เล็ก		กล	าง 🗆	ให	ល្ង់
80 ชื่อผู้สัมภาษณ์							
81 วันที่สัมภาษณ์//	الَّا)						
82 ชื่อผู้ให้สัมภาษณ์							
83 ตำแหน่ง (เจ้าของ/ผู้จัดการ/หัวหน้า							
คนงาน)							
84 เบอร์โทรศัพท์							
85 บ้านเลขที่							
86 หมู่ที่							
87 ตำบล							
88 อำเภอ							
89 จังหวัด							
ส่วนที่ I: สิ่งแวดล้อม						'	
สถานที่ตั้งฟาร์ม:							
90 ฟาร์มของคุณห่างจากสถานที่เหล่านี้เป็นระยะทางเท่าไร							
90A พื้นที่การเกษตรกม.							
90B โรงงานอุตสาหกรรมกม.							
90C ทะเลกม.							
90D แม่น้ำกม.							
90E ป่าชายเลนกม.							
90F พื้นที่ชุ่มน้ำกม.							
90G โรงแรมกม.							



90H สถานที่ท่องเที่ยวกม.								
90I ชุมชน/หมู่บ้านกม.								
90J ฟาร์มกุ้งกม.								
ประวัติการใช้พื้นที่:								
91 ก่อนที่จะเป็นฟาร์มกุ้งพื้นที่ตรง	นี้เคยเป็นอะไรมาก่อน							
1. ป่าชายเลน	2. ป่าเสม็ด (Maleuleuca	swamp)						
3. พื้นที่ชุ่มน้ำ	4. นาข้าว							
5. สวน	6. พื้นที่ไม่ใช้ประโยชน์							
92 คุณมีเอกสารสิทธิ์ที่ดินหรือ หรือไม่	1. มี (ระบุประเภท)	2. ไม่มี					
แผนผังฟาร์ม:								
93 ฟาร์มคุณมีพื้นที่ทั้งหมดเท่าไรไร่								
94 คุณทำการเลี้ยงกุ้งทั้งหมดกี่บ่อ.								
95 บ่อเลี้ยงมีขนาดพื้นที่เท่าไร	ไร่/บ่อ							
96 คุณมีบ่อตกตะกอนหรือไม่	1 มี (ระบุขนาดบ่อไ	i)	2 ไม่มี					
97 คุณมีบ่อเก็บน้ำหรือไม่	1 มี (ระบุขนาดบ่อไ	i)	2 ไม่มี					
98 ฟาร์มของคุณมีแนวกันชนป้องกั หรือไม่	นการกระจายตัวของความเค็ม	1 มี	2 ไม่มี					
99 ระบบน้ำเข้าน้ำออกในฟาร์มขอ	งคุณแยกออกจากกันหรือไม่	1 រីរ	2 ไม่มี					
100 ฟาร์มของคุณมีรั้วรอบฟาร์มห	รือไม่	1 มี	2 ไม่มี					
การเตรียมบ่อ:			-					
101 คุณมีการเลี้ยงกุ้งกี่รอบใน 1 เี	รอบ/ปี							
102 คุณมีระยะพักบ่อนานเท่าไรระ	หว่างรอบการเลี้ยง สัป	ดาห์						
103 คุณมีการเตรียมบ่ออย่างไรก่อ	นปล่อยกุ้งรอบต่อไป							



103A ตากบ่อ	1 ใช่	2 ไม่ใช่		
103B ใช้วัสดุปูน	1 ใช่	2 ไม่ใช่		
103C ใช้จุลินทรีย์	1 ใช่	2 ไม่ใช่		
103Dกลับหน้าดิน	1 ใช่	2 ไม่ใช่		
103E มีการฉีดเลนไปทิ้ง	1 ใช่	2 ไม่ใช่		
103F วิธีการอื่น, โปรดระบุ				
តូกกุ้ง:				
104 ในระยะเวลา 12 เดือนที่ผ่านมาคุณซื้อลูกกุ้งจากโร	งเพาะฟักประเภ	ทใด		
104A โรงเพาะฟัก GAP	1 ใช่	2 ไม่ใช่		
104B โรงเพาะฟัก CoC	1 ใช่	2 ไม่ใช่		
104C โรงเพาะฟักของฟาร์ม	1 ใช่	2 ไม่ใช่		
104Dโรงเพาะฟักอื่น ๆ	1 ใช่	2 ไม่ใช่		
105 คุณมีเหตุผลอะไรในการเลือกซื้อลูกกุ้งจากโรงเพา	ะฟักดังกล่าว			
105A คุณภาพ	1 ใช่	2 ไม่ใช่		
105B ราคา	า ใช่	2 ไม่ใช่		
105C เครดิต	า ใช่	2 ไม่ใช่		
105D ความเชื่อใจ	า ใช่	2 ไม่ใช่		
106 คุณปล่อยกุ้งในความหนาแน่นเท่าไร เมตร	ตัว/ไร่	ตัว/ตาราง		
107 คุณมีวิธีการตรวจสอบคุณภาพลูกกุ้งอย่างไร				
107Aโรงเพาะฟักส่งตรวจที่ห้องแล็ปเอกชน (PCR)	1 ใช่	2 ไม่ใช่		
107B โรงเพาะฟักส่งตรวจที่หน่วยงานกรมประมง	1 ใช่	2 ไม่ใช่		
107C ฟาร์มส่งตรวจที่ห้องแล็ปเอกชน (PCR)	1 ใช่	2 ไม่ใช่		
107D ฟาร์มส่งตรวจที่หน่วยงานกรมประมง	1 ใช่	2 ไม่ใช่		



107E อื่น ๆ โปรดระบุ	•••••			
อาหารกุ้ง:				
108 คุณมีการใช้อาหารประเภทใดตามหัวข้อดังนี้				
108A อาหารเม็ด	1 ใช่	2 ไม่ใช่		
108B อาหารสด	1 ใช่	2 ไม่ใช่		
108C อาหารธรรมชาติ (จากการทำสีน้ำ)	1 ใช่	2 ไม่ใช่		
109 กรณีที่ใช้อาหารเม็ด คุณเลือกใช้อาหารจากบริเ	ษัทใด			
109A ซีพี	1 ใช่	2 ไม่ใช่		
109B ไทยยูเนี่ยน	1 ใช่	2 ไม่ใช่		
109C กรุงไทย	1 ใช่	2 ไม่ใช่		
109Dลีพัฒนา	1 ใช่	2 ไม่ใช่		
109E ไทยลักซ์	1 ใช่	2 ไม่ใช่		
109F แลปอินเตอร์	1 ใช่	2 ไม่ใช่		
109G โกรเบส	1 ใช่	2 ไม่ใช่		
109H บริษัทอื่น ๆ, โปรดระบุ				
110 เหตุผลที่คุณเลือกใช้อาหารเม็ดจากบริษัทดังกล่	าว			
110A คุณภาพ	1 ใช่	2 ไม่ใช่		
110B ราคา	1 ใช่	2 ไม่ใช่		
110C เครดิต	1 ใช่	2 ไม่ใช่		
110D การจัดซื้อแบบรวมกลุ่ม	1 ใช่	2 ไม่ใช่		
111 มีการเก็บอาหารหรือไม่	1 ใช่	2 ไม่ใช่		
112 คุณเก็บอาหารสำเร็จรูปที่ใดในฟาร์ม	I			
112A ข้างบ่อเลี้ยง	1 ใช่	2 ไม่ใช่		
112B ห้องเก็บอาหาร	1 ใช่	2 ไม่ใช่		



33C อื่นๆ (ระบุ			•••••)			
113 คุณมีการบันทึกปริมาณอาหารที่ใช้หรื	อไม่		1 มี		2 ไม่มี			
114 คุณเคยมีการคำนวณ FCR ในการเลี้ยงรอบที่ผ่านมาหรือไม่								
1 เคย (เมื่อปีที่แล้ว FCR ประมาณ)		2 ไม่เคย			
การจัดการสุขภาพ:								
115 มีการตรวจสุขภาพของกุ้งในฟาร์มหรือ	าไม่	1	มี	2 ไม่	มี (ไปข้อ 38)			
116 ตรวจสุขภาพกุ้งภายในฟาร์ม อย่างไร		•	•					
116A ตรวจดูลักษณะของกุ้งที่เข้ามาในยอ			1 1	.ช่	2 ไม่ใช่			
116B ดำน้ำลงไปตรวจการตายของกุ้งที่พื้น	บ่อ		1 1	.ช่	2 ไม่ใช่			
116C ทำการสุ่มกุ้งทุกเดือนไปตรวจโรค			1 1	.ช <u>่</u>	2 ไม่ใช่			
116Dวิธีการอื่น, โปรดระบุ		1			1			
	••••••	•••••	• • • • • • • • •	•••••				
117 คุณมีการตรวจอัตราการเจริญเติบโตขอ หรือไม่	วงกุ้ง	1 มี		Ref	มี (ไปข้อ Error! ference source found.40)			
118 คุณตรวจอัตราการเจริญเติบโตของกุ้งอ	าย่างไร							
118A ตรวจน้ำหนักและขนาดทุกเดือน			1	ใช่	2 ไม่ใช่			
118B กุ้งที่ติดมาในยอเช็คอาหาร			1	ใช่	2 ไม่ใช่			
118C วิธีการอื่น, โปรดระบุ			ı					
	•••••	•••••	•••••					
119 คุณมีการจัดการอย่างไรเมื่อพบว่ากุ้งมี	การติดเชื้อห	เรือเริ่มจ	ะเป็นโ	รค				
119A เติมคลอรีนเพื่อไม่ให้เชื้อ แพร่กระจาย	1 เป็นประ	ะจำ	2 บางเ	- ครั้ง	3 ไม่เคย			
119B ใช้ยา	1 เป็นประ	ะจำ	2 บางเ	ครั้ง	3 ไม่เคย			
119C จับขายทันที	1 เป็นปร	ะจำ	2 บางเ	- ครั้ง	3 ไม่เคย			



119Dจำกัดการเข้า-ออกของคนงาน	1 เป็นประจำ	2 บางครั้ง	3 ไม่เคย		
การใช้ยาและสารเคมี:					
120 ใช้คลอรีน	120 ใช้คลอรีน				
121 ใช้ปูน (ปูนหอย, ปูนเกษตร,ปูนขาว)	121 ใช้ปูน (ปูนหอย, ปูนเกษตร,ปูนขาว)				
122 ใช้กากชา		1 ใช้	2 ไม่ใช้		
123 ใช้โล่ติ้น		1 ใช้	2 ไม่ใช้		
124 อื่น ๆ โปรดระบุ	•••••				
125 คุณมีคู่มือความปลอดภัยในการใช้ยา	หรือไม่	1 มี	2 ไม่มี		
126 คุณรู้เกี่ยวกับคุณสมบัติของสารเคมีห์ ที่อนุญาตให้ใช้ในฟาร์มกุ้งหรือไม่	1 รู้	2 ไม่รู้			
127 คุณรู้เกี่ยวกับคุณสมบัติของสารเคมีห์ อย่างไร	รื่อชนิดของสารเคมีเ	า ที่อนุญาตให้ใช้ใ	นฟาร์มกุ้งได้		
127A ฉลากข้างกล่องยา		1 ใช่	2 ไม่ใช่		
127B จากตัวแทนจำหน่าย/ร้านขาย		1 ใช่	2 ไม่ใช่		
127C จากผู้เลี้ยงกุ้งรายอื่น		1 ใช่	2 ไม่ใช่		
127Dจากกรมประมง		1 ใช่	2 ไม่ใช่		
128 สารเคมีที่ยังไม่ได้ใช้ โดยทั่วไปแล้วคุณ	นเก็บไว้ที่ไหน				
1. ใกล้กับบ่อเลี้ยง	2. มีห้องเก็	บที่มิดชิด			
 ไม่มีห้องสำหรับเก็บเนื่องจากชื้อเมื่ 	 อต้องการใช้และใช้ใ	็นทันที			
129 คุณมีการทำบัญชีรายการการเก็บสารเ หรือไม่	คมีและการใช้สารเค	ามีในฟาร์ม	1 มี 2 ไม่มี		
130 คนที่สามารถเข้าไปใช้สารเคมีได้มีจำเ ระบุ)	เวนเท่าไร?		คน (โปรด		
131 ใครเป็นคนตัดสินใจในการใช้สารเคมี	(สำหรับสารเคมีบา	งชนิด)			



1. เจ้าของฟาร์ม	2. ผู้จัดการฟาร์	้ม	:	3. คนงาน				
132 คนที่ได้รับอนุญาตในการค ฝึกอบรมการใช้สารเคมีและ หรือไม่	์ ว้าง	1 เคย	2 ไม่เคย					
133 ทางฟาร์มมีการจัดเตรียมเครื่องมือเฉพาะที่ใช้ในการตวงหรือ การผสมสารเคมีบ้างหรือไม่ (ภาชนะสำหรับบรรจุ, เครื่องชั่ง)					2 ไม่มี			
134 คุณมีวิธีการกำจัดภาชนะเ	เรรจุสารเคมีตามวีธีดัง	นี้หรือไม่						
134A ฝังกลบภายในฟาร์ม				1 ใช่	2 ไม่ใช่			
134B ทิ้งในระบบกำจัดขยะทั่ว	ไปซึ่งจะถูกแยกโดยเทเ	ศบาล		1 ใช่	2 ไม่ใช่			
134C นำกลับมาใช้ใหม่				1 ใช่	2 ไม่ใช่			
134D ขายให้คนซื้อของเก่า				1 ใช่	2 ไม่ใช่			
การใช้พลังงาน:								
135 ฟาร์มคุณใช้เครื่องตีน้ำแบ	บใบพัดหรือไม่	1 ใช้		2 ไม่ใช้				
136 ฟาร์มคุณใช้เครื่องเติมอา	าาศแบบใต้น้ำ	1 ใช้		2 ไม่ใช้				
137 ฟาร์มคุณใช้เครื่องเติมอาก ไร่	าาศแบบใบพัด		แขน		ใบพัด/			
138 ระยะเวลาในการเปิดเครื่อ	งตีน้ำแบบใบพัด							
1 เปิด 24 ชั่วโมง/วัน ย	าเว้นเวลาให้อาหาร							
2 อื่น ๆ โปรดระบุ								
139 ฟาร์มคุณใช้เครื่องเติมอา 141)	าาศแบบใต้น้ำจำนวน.		•••••	เครื่อง (ไม่ใช้ไปข้อ			
140 ระยะเวลาในการเปิดเครื่อ	งเติมอากาศแบบใต้น้ำ	1						
1 เปิด 24 ชั่วโมง/วัน ยเ	าเว้นเวลาให้อาหาร							
2 อื่นๆ โปรดระบุ								
141 คุณมีการใช้น้ำมันดีเชลหรื	รอไม่ 1	ใช้	2	ไม่ใช้ (ข้าม	ไปข้อ 144)			



142 คุณมีการจดบันทึกการใช้น้ำมันหรือไม่	1 มี	2 ไม่	เมื				
143 คุณมีการใช้น้ำมันกี่ลิตร/วันหรือกี่ลิตร/รอบ	ຄີເ	์ ตร/วัน.		ลิตร/			
รอบ							
144 คุณมีการใช้ไฟฟ้าในการเลี้ยงกุ้งหรือไม่	1 ใช้	2 ไม่	ใช้ (ข้ามไปข	ข้อ 147)			
145 คุณมีการจดบันทึกการใช้ไฟฟ้าหรือไม่	1 มี	2 ไม่	เมื				
146 คุณใช้ไฟฟ้าเป็นจำนวนกี่บาท	บาท/เดือ	าน		บาท/รอบ			
147 คุณมีการใช้พลังงานทางเลือกอื่นหรือไม่	1 มี (ระบ)	2 ไม่มี			
148 คุณมีการปรับปรุงประสิทธิภาพการใช้	1 มี (ระบุ	2 ไม่มี					
พลังงานหรือไม่		•••••)				
น้ำ, คุณภาพน้ำ, น้ำเสีย, น้ำทิ้ง, ตะกอน:	1			<u>'</u>			
149 แหล่งน้ำใช้มาจากแหล่งใด							
1. ทะเล	2. คล						
3. แม่น้ำ หรือ คลองจากป่าชายเลน	4. น้ำ	บาดาล					
150 คุณใช้น้ำจืดเพื่อเจือจางความเค็มหรือไม่	1 ใช้		2 ไม่ใช้				
151 คุณมีการจดบันทึกการใช้น้ำหรือไม่ (น้ำเข้า +	การเปลี่ยนถ่า	ายน้ำ)	1 มี	2 ไม่มี			
152 คุณมีการตรวจคุณภาพน้ำระหว่างการเลี้ยงหรือ	าไม่						
1. มี, อย่างไร				2. ไม่มี			
			•				
153 คุณทราบเกี่ยวกับมาตรฐานคุณภาพน้ำทิ้งบ้าง	1 ทราบ	2	ไม่ทราบ (ไเ	ใช้อ 155)			
หรือไม่							
154 ทราบอะไรบ้างเกี่ยวกับมาตรฐานคุณภาพน้ำทิ้ง	า (ยกตัวอย่าง	1					
)							
155 คุณมีการตรวจและการจดบันทึกคุณภาพน้ำทิ้ง	หรือไม่						



1. มี (ปีละครั้ง, ปีละ 2 ครั้ง, ทุกรอบของการ	รเลี้ยง) 2.	ไม่มี				
156 คุณมีการบำบัดน้ำทิ้งก่อนมีการถ่ายน้ำหรือไม่						
1 มี, อย่างไร		2	ไม่มี			
157 คุณมีการนำน้ำทิ้งที่ผ่านการบำบัดแล้วมาใช้ให	ม่หรือไม่	•				
1 มี, อย่างไร		2	ไม่มี			
158 คุณถ่ายน้ำจากบ่อเลี้ยงกุ้งไปที่ใด						
1. คลองรับน้ำเสียภายในฟาร์ม	2. คลองชลบ	ไระทาน (สา	ธารณะ)			
 ปล่อยลงคลองของป่าชายเลน หรือ แม่น้ำ 	4. ปล่อยลงท	าะเล				
159 คุณมีการนำตะกอนเลนออกจากบ่อหรือไม่						
1. มี (ปีละครั้ง, ปีละ 2 ครั้ง, ทุกรอบของกา	รเลี้ยง)		2. ไม่มี			
160 คุณมีวิธีการจัดการกับตะกอนเลนอย่างไร		1				
160A ไถพรวน และ ตากแดด		1 ใช่	2 ไม่ใช่			
160B ผสมกับน้ำเพื่อให้เกิดการเจริญของแพลงก์ต	าอน	1 ใช่	2 ไม่ใช่			
160C นำออกจากบ่อเลี้ยงและนำไปทิ้งในบ่อเก็บตร ฟาร์ม	ะกอนภายใน	1 ใช่	2 ไม่ใช่			
160D ทิ้งในแหล่งน้ำธรรมชาติ		1 ใช่	2 ไม่ใช่			
160E วิธีอื่น ๆ, โปรดอธิบาย						
ความหลากหลายทางชีวภาพ:						
161 ตั้งแต่เริ่มตั้งฟาร์มจำนวนของสัตว์ท้องถิ่น/พืช หรือไม่	ท้องถิ่นเพิ่มขึ้น	1 เพิ่ม	2 ไม่เพิ่ม			
162 มีวิธีการป้องกันไม่ให้กุ้งจากฟาร์มหลุดรอดออ หรือไม่	กสู่ธรรมชาติ	1 มี	2 ไม่มี			
163 คุณมีวิธีการป้องกันไม่ให้กุ้งจากฟาร์มหลุดรอด	คออกสู่ธรรมชาติอย	iางไร				
163A ระบบปิด		1 ใช่	2 ไม่ใช่			



163B ใช้ระบบการกรอง		1 ใช่	2 ไม่ใช่			
163C วิธีการอื่น, อธิบาย						
ส่วนที่ II : สังคม						
การจ้างงาน:						
164 จำนวนคนงานที่ทำงานประจำในฟาร์ม (ถ้าไม่มีคนงาน	นข้ามไปข้อ 1	185)				
164A หญิงคน						
164B ชายคน						
165 คนงานเป็นคนสัญชาติใด						
165Aไทยคน						
165B พม่า คน						
165C ลาวคน						
165D เขมร คน						
166 มีแรงงานเด็กหรือไม่	1	ใช่	2 ไม่ใช่			
167 ได้มีการทำสัญญาว่าจ้างคนงานหรือไม่	1	ใช่	2 ไม่ใช่			
168 ท่านปฏิบัติตามข้อกำหนดในสัญญาการจ้างงาน	1	ใช่	2 ไม่ใช่			
169 ท่านจ่ายค่าแรงคนงานตามที่กฎหมายแรงงานกำหนด หรือไม่	1	ใช่	2 ไม่ใช่			
90A หญิงบาท/เดือน		บาท/วั	u		\top	
169B ชายบาท/เดือน		. บาท.	/วัน			
170 คนงานได้รับค่าตอบแทนเพิ่มเติมในการจับกุ้ง หรือไม่	1 ได้รับ 2	2 ไม่ได้รับ	(ไปข้อ 171)			
92 A ได้รับค่าตอบแทนเพิ่มเติมเท่าไหร่		บาท/กิโ	โลกรัม			
171 คนงานได้รับเงินพิเศษเพราะตำแหน่งหรือประสบการ	ณ์ 1	ได้รับ	2 ไม่ได้รับ			
หรือไม่			(ไปข้อ 172)			
93A ตำแหน่ง	•	1				



93B ได้รับค่าตอบแทนเพิ่มเติมเท่าไหร่	บาท/กิโ	.ลกรัม		
93C ได้รับเงินสุทธิบาท/วัน				
172 มีเอกสารแสดงการรับจ่ายเงินหรือไม่	1 ใช่	2 ไม่ใช่		
(เช่น สลิปเงินเดือน หรือ สมุดจ่ายเงินเดือนและเซ็นชื่อรับ)				
173 ในช่วงระยะเวลาปกติ คนงานสามารถหยุดงานได้กี่วันต่อ	เดือน	วัน		
174 โดยเฉลี่ยคนงานที่ขาดงานเนื่องจากไม่สบายหรือได้รับกา	รบาดเจ็บ	คน-วัน/เดือน		
175 คู่สมรสของคนงานได้รับอนุญาตให้พักในบ้าน	1 ใช่	2 ไม่ใช่		
176 จ้างคู่สมรสให้ทำงานในฟาร์มด้วย	1 ใช่	2 ไม่ใช่		
177 อนุญาตให้บุตรคนงานพักในฟาร์มด้วย	1 ใช่	2 ไม่ใช่		
ความเป็นอยู่:	1	1		
178 ฟาร์มได้จัดเตรียมสวัสดิการให้คนงาน				
178A ที่พัก	1 ใช่	2 ไม่ใช่		
178B อาหาร	1 ใช่	2 ไม่ใช่		
178C น้ำ	1 ใช่	2 ไม่ใช่		
178D ห้องครัว	1 ใช่	2 ไม่ใช่		
178E ห้องน้ำ	1 ใช่	2 ไม่ใช่		
178F ที่อาบน้ำ	1 ใช่	2 ไม่ใช่		
178G ที่ล้างมือ	1 ใช่	2 ไม่ใช่		
178H รถยนต์ประจำฟาร์ม	1 ใช่	2 ไม่ใช่		
178I อื่นๆ (แก๊ส ข้าวสาร ค่าไฟ ตู้เย็น)	1 ใช่	2 ไม่ใช่		
179 ฟาร์มได้จัดเตรียมอุปกรณ์สำหรับความปลอดภัย	1	1		
179A อุปกรณ์การปฐมพยาบาลเบื้องต้น	1 ใช่	2 ไม่ใช่		
179B เสื้อผ้าป้องกันภัย	1 ใช่	2 ไม่ใช่		
179C ที่ล้างตาเวลาสารเคมีเข้าตา	1 ใช่	2 ไม่ใช่		



1 ใช่ 2 โมใช่	y	1 .	T 40	-	1	
180 ฟาร์มดูแลคนงานหากเกิดการเจ็บป่วยหรือต้องพบแพทย์ 1 ใช่ 2 ไม่ใช่ 101A มีรถยนต์ไปส่ง 1 ใช่ 2 ไม่ใช่ 101B จ่ายค่ายา 1 ใช่ 2 ไม่ใช่ 101C จ่ายค่าตรวจรักษากรณีพบแพทย์ 1 ใช่ 2 ไม่ใช่ 181 มีอุบัติเหตุจากการทำงานในฟาร์มหรือไม่ 1 มี 2 ไม่มี 102A ได้รับบาดเจ็บจากการทำงานจนต้องเข้าพักรักษาตัวใน 1 มี 2 ไม่มี 15xพยาบาล 1 ใช่ 2 ไม่ใช่ 182 ใน 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่หรือไม่: *** 182 โม 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่หรือไม่: *** 182A มีการต่อสู้หรือความรุนแรงทางร่างกายเป็นเหตุให้ต้องพบ 1 ใช่ 2 ไม่ใช่ 182B มีการดื่มเหล้าหรือเสพยาอื่น ๆชิ่งทำให้คนงานหยุดงาน 1 ใช่ 2 ไม่ใช่ 182C มีการขโมยทรัพย์สินของคนงาน 1 ใช่ 2 ไม่ใช่ 182D มีการขโมยทรัพย์สินของคนงานเก่า *** *** *** ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: *** *** *** 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มและคนงานสม่าเสมอ 1 มี *** *** 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่าหันธ์ระหว่างเจ้าของฟาร์มและคนงานสม่าหันธ์ระหว่างทำงรัมและสมมหันธ์ระหว่างฟาร์มและสุมหนายงที่ 185 ฟาร์มของท่านสม	179Dการอบรมการปฐมพยาบาลเบืองต้น	1 ใช่	2 ไม่ใช่			
101A มีรถยนต์ไปส่ง	179E การแนะนำการใช้สารเคมื่อย่างปลอดภัย	1 ใช่	2 ไม่ใช่			
1 ใช่ 2 ไม่ใช่ 1 ใช่ 2 ไม่มี 1 ใช่ 2 ไม่ใช่ 1 ใช่ 2 ไม่มี 1 ใช่ 4 ประชุมระหว่างเจ้าของฟาร์มและคนงาน: 1 ใช่ 2 ไม่มี 1 ใช่ 2 ไม่มี 1 ใช่ 2 ไม่มี 1 ใช่ 2 ไม่มี 1 ใช่ 4 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่าเสมอ 1 มี 2 ไม่มี 1 ใช่ 3 ให้มี 1 ใช่ 4 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่าเสมอ 1 มี 2 ไม่มี 1 ใช่ 2 ไม่ใช่ 1 ใช่ 2 ไม่มี 1 ใช่ 2 ไม่มี 1 ใช่ 3 ให้มี 1 ใช่ 4 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่าเสมอ 1 มี 2 ไม่มี 1 ใช่ 2 ไม่ใช่ 1 ใช่ 3 ให้มี 1 ใช่ 3 ให้มี 1 ใช่ 4 ใช้มี 1 ใช้ 4 ใช้มีมี 1 ใช้ 4 ใช้มีมี 1 ใช้มีมี 1 ใช้ 4 ใช้มีมี 1 ใช่ 4 ใช้มีมีมีมีมีมีมีมีมีมีมีมีมีมีมีมีมีมีมี	180 ฟาร์มดูแลคนงานหากเกิดการเจ็บป่วยหรือต้องพบแพทย์	1 ใช่	2 ไม่ใช่			
101C จ่ายค่าตรวจรักษากรณีพบแพทย์ 11 ใช่ 2 ไม่ใช่ 181 มีอุบัติเหตุจากการทำงานในฟาร์มหรือไม่ 102A ได้รับบาดเจ็บจากการทำงานจนต้องเข้าพักรักษาตัวใน 1 มี 2 ไม่มี 102A ได้รับบาดเจ็บจากการทำงานจนต้องเข้าพักรักษาตัวใน 1 มี 2 ไม่มี 1 มี 2 ไม่ใช่ 1 มี 2 ไม่มี	101A มีรถยนต์ไปส่ง	1 ใช่	2 ไม่ใช่			
181 มีอุบัติเหตุจากการทำงานในฟาร์มหรือไม่ 1 มี 2 ไม่มี 102 ได้รับบาดเจ็บจากการทำงานจนต้องเข้าพักรักษาตัวใน 1 มี 2 ไม่มี โรงพยาบาล 1 ใช่ 2 ไม่ใช่ 102 เสียชีวิตเนื่องจากอุบัติเหตุจากการทำงาน, อธิบาย 1 ใช่ 2 ไม่ใช่ 182 ใน 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่หรือไม่: 1 182 A มีการต่อสู้หรือความรุนแรงทางร่างกายเป็นเหตุให้ต้องพบ 1 ใช่ 2 ไม่ใช่ 182B มีการดื่มเหล้าหรือเสพยาอื่น ๆ ซึ่งทำให้คนงานหยุดงาน 1 ใช่ 2 ไม่ใช่ 182C มีการขโมยทรัพย์สินของคนงาน 1 ใช่ 2 ไม่ใช่ 182D มีการขโมยกุ้งหรืออุปกรณ์ต่าง ๆ จากฟาร์มโดยคนงาน 1 ใช่ 2 ไม่ใช่ ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 1 มี 2 ไม่มี 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 1 ใช่ 2 ไม่ใช่ 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่		1 ใช่	2 ไม่ใช่			
102A ได้รับบาดเจ็บจากการทำงานจนต้องเข้าพักรักษาตัวใน 1 มี 2 ไม่มี โรงพยาบาล 102B เสียชีวิตเนื่องจากอุบัติเหตุจากการทำงาน, อธิบาย 1 ใช่ 2 ไม่ใช่	101C จ่ายค่าตรวจรักษากรณีพบแพทย์	1 ใช่	2 ไม่ใช่			
โรงพยาบาล 102B เสียชีวิตเนื่องจากอุบัติเหตุจากการทำงาน, อธิบาย 1 ใช่ 2 ไม่ใช่ 182 ใน 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่หรือไม่: 182A มีการต่อสู้หรือความรุนแรงทางร่างกายเป็นเหตุให้ต้องพบ		1 มี	2 ไม่มี			
182 ใน 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่หรือไม่: 182A มีการต่อสู้หรือความรุนแรงทางร่างกายเป็นเหตุให้ต้องพบ แพทย์ 1 ใช่ 2 ไม่ใช่ 2 ไม่ใช่ 3 182B มีการดื่มเหล้าหรือเสพยาอื่น ๆ ซึ่งทำให้คนงานหยุดงาน 1 ใช่ 2 ไม่ใช่ 3 1 ใช่ 2 ไม่ใช่ 3 182C มีการขโมยทรัพย์สินของคนงาน 1 ใช่ 2 ไม่ใช่ 4 1 ใช่ 2 ไม่ใช่ 5 182D มีการขโมยกุ้งหรืออุปกรณ์ต่าง ๆ จากฟาร์มโดยคนงาน ปัจจุบันหรือคนงานเก่า 4 1 ใช่ 2 ไม่ใช่ 5 ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 1 มี 2 ไม่มี 5 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 5 2 ไม่มี 5 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 1 ใช่ 2 ไม่ใช่ 5 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่ 5		1 มี	2 ไม่มี			
182A มีการต่อสู้หรือความรุนแรงทางร่างกายเป็นเหตุให้ต้องพบ แพทย์ 1 ใช่ 2 ไม่ใช่	102B เสียชีวิตเนื่องจากอุบัติเหตุจากการทำงาน, อธิบาย	1 ใช่	2 ไม่ใช่			
 แพทย์ 182B มีการดื่มเหล้าหรือเสพยาอื่น ๆซึ่งทำให้คนงานหยุดงาน 1 ใช่ 2 ไม่ใช่ 182C มีการขโมยทรัพย์สินของคนงาน 1 ใช่ 2 ไม่ใช่ 182D มีการขโมยกุ้งหรืออุปกรณ์ต่าง ๆ จากฟาร์มโดยคนงาน บัจจุบันหรือคนงานเก่า ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่ 	182 ใน 1 ปีที่ผ่านมามีเหตุการณ์เหล่านี้เกิดขึ้นในฟาร์มของท่านใช่ห	 เรือไม่:				
182C มีการขโมยทรัพย์สินของคนงาน 1 ใช่ 2 ไม่ใช่ 182D มีการขโมยกุ้งหรืออุปกรณ์ต่าง ๆ จากฟาร์มโดยคนงาน 1 ใช่ 2 ไม่ใช่ บัจจุบันหรือคนงานเก่า 1 ใช่ 2 ไม่ใช่ ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 2 ไม่มี 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 2 ไม่มี 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 1 ใช่ 2 ไม่ใช่ 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่	·	1 ใช่	2 ไม่ใช่			
182D มีการขโมยกุ้งหรืออุปกรณ์ต่าง ๆ จากฟาร์มโดยคนงาน 1 ใช่ 2 ไม่ใช่ บัจจุบันหรือคนงานเก่า 1 ใช่ 2 ไม่ใช่ ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 1 มี 2 ไม่มี 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 1 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่	182B มีการดื่มเหล้าหรือเสพยาอื่น ๆซึ่งทำให้คนงานหยุดงาน	1 ใช่	2 ไม่ใช่			
ปัจจุบันหรือคนงานเก่า ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน: 183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 1 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่	182C มีการขโมยทรัพย์สินของคนงาน	1 ใช่	2 ไม่ใช่			
183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้ 1 มี 2 ไม่มี 184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 185A ระบบคมนาคม 1 ใช่ 2 ไม่ใช่		1 ใช่	2 ไม่ใช่			
184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ 1 มี 2 ไม่มี 1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 1 ใช่ 2 ไม่ใช่	ความสัมพันธ์ระหว่างเจ้าของฟาร์มและคนงาน:	-	1			
1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์มและชุมชน: 185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 185A ระบบคมนาคม 1 ใช่ 2 ไม่ใช่	183 แต่งตั้งตัวแทนคนงานที่สามารถพูดคุยกับเจ้าของฟาร์มได้	1 มี	2 ไม่มี			
185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้ 185A ระบบคมนาคม 1 ใช่ 2 ไม่ใช่	184 ประชุมระหว่างเจ้าของฟาร์มและคนงานสม่ำเสมอ	1 มี	2 ไม่มี			
185A ระบบคมนาคม 1 ใช่ 2 ไม่ใช่	1.1 ความรับผิดชอบต่อสังคม & ความสัมพันธ์ระหว่างฟาร์ม	และชุมชน:				
	185 ฟาร์มของท่านส่งผลให้มีการพัฒนาชุมชนดังนี้					
185B ระบบไฟฟ้า 1 ใช่ 2 ไม่ใช่	185A ระบบคมนาคม	1 ใช่	2 ไม่ใช่			
	185B ระบบไฟฟ้า	1 ใช่	2 ไม่ใช่			



2 ไม่ใช่ 2 ไม่ใช่ 2 ไม่ใช่ 2 ไม่ใช่ 2 ไม่ใช่ 2 ไม่ใช่				
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187F ชาวประมง		1 ใช่	2 ไม่ใช่			
188 มีการเข้าร่วมกิจกรรมของชุมชนต่อไปนี้หรือไม่						
109A ชมรม/สมาคมผู้เลี้ยงกุ้ง		า ใช่	2 ไม่ใช่			
109B การอบรมทางวิชาการที่เกี่ยวข้องกับการเลี้ยงกุ้	1	1 ใช่	2 ไม่ใช่			
109C กิจกรรมบำเพ็ญประโยชน์เพื่อส่วนรวม		1 ใช่	2 ไม่ใช่			
ส่วนที่ III : เศรษฐศาสตร์						
การผลิต รายรับ และต้นทุนการผลิต:						
189 ลักษณะของการจับกุ้งขาย						
189A จับขายบางส่วน	1 ใช่		2 ไม่ใช่			
189B จับขายครั้งเดียว	1 ใช่		2 ไม่ใช่			
190 ขนาดกุ้งเฉลี่ยที่จับได้	ตัว	J/kg				
191 ท่านขายผลผลิตกุ้งที่ใด						
191A ขายตรงกับโรงงานแปรรูป (สัญญาซื้อขายล่วงหนึ่	í n)	1 ใช่	2 ไม่ใช่			
191B พ่อค้าคนกลาง (แพ หรือ นายหน้า)		1 ใช่	2 ไม่ใช่			
191C ตลาดมหาชัย		1 ใช่	2 ไม่ใช่			
192 กรณีทำสัญญาชื้อขายล่วงหน้า ท่านทำสัญญาเรื่องใ	ดบ้าง					
192A คุณภาพกุ้ง (ขนาดกุ้ง อุณหภูมิกุ้ง ณ จุดรับ ลักษ	เณะภายนอก)	1 ใช่	2 ไม่ใช่			
192B ราคาขาย		1 ใช่	2 ไม่ใช่			
192C จำนวนขาย		1 ใช่	2 ไม่ใช่			
192D เวลาส่งมอบ		1 ใช่	2 ไม่ใช่			
192E เอกสาร GAP/CoC		1 ใช่	2 ไม่ใช่			
192F เอกสาร MD			2 ไม่ใช่			
192G อื่น ๆ โปรดระบุ	•••••					
193 รายละเอียดต้นทุนการผลิต						



193A ค่าลูกกุ้งบาท						
193B การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193C อาหารกุ้งบาท		1	ı			
193Dการเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193E เชื้อเพลิง/น้ำมัน	บาท		<u>I</u>			
193F การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193G ค่าไฟฟ้าใช้ในการผลิต		า เาท				
193Hการเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193I ทำความสะอาดบ่อเลี้ยง	ນີ	าท				
193J การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193K ต้นทุนการดูแลรักษา /เตรียมบ่อและเครื่องจักร	•••••		บาท			
193L การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193M แรงงานครัวเรือน	บาท	<u> </u>				
193N การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
1930 แรงงานจ้างนอกครัวเรือน		บาท	I			
193P การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193Q ค่าขนส่งลูกกุ้ง	บาท	1	I			
193R การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
1938 ค่าขนส่งผลผลิตกุ้ง	บาท	1	I			
193T การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193U ค่าตรวจสอบลูกกุ้ง	บาท		I			
193V การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193W อื่น ๆระบุ		ປົ	าท			
193X การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
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รายละเอียดต้นทุนผันแปร และต้นทุนคงที่:						
193Y ภาษีที่ดินบา	าท					
193Z การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193AA ค่าเช่าที่ดิน						
193BB การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193CC รายจ่ายอัตราดอกเบี้ย		บาท				
193DDการเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
					,	
193EE ค่าเสียโอกาสของที่ดิน		บาท				
193FF การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193GGค่าเสื่อมของทรัพย์สิน	บา	n				
193HHการเปลี่ยนแปลงหลังจากได้รับการรับรอง		2 เท่าเดิม	3 สูงขึ้น			
19311 ต้นทุนผันแปรทั้งหมด	บ	าท				
193JJการเปลี่ยนแปลงหลังจากได้รับการรับรอง		2 เท่าเดิม	3 สูงขึ้น			
193KK ต้นทุนคงที่ทั้งหมด	บาท		•			
193LL การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193MM ต้นทุนรวมทั้งหมด		าท				
193NNการเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
รายละเอียดรายรับ:			1			
19300ผลผลิตตันต่อไ	ร่ (รอบเลี้ยง	ที่ผ่านมา หรือ	ปีที่ผ่าน			
มา)						
193PP การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193QQราคาที่เกษตรกรได้รับ	บาท	ต่อกิโลกรัม				
193RR การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น			
193SS มูลค่าผลผลิต (บาท/ไร่)	บา	ท/ไร่				



1 ลดลง 2 เท่าเดิม 3 สูงขึ้น 193UUรายรับสุทธิต่อไร่		T	T	92	1 1	 1
193VVการเปลี่ยนแปลงหลังจากได้รับการรับรอง 1 ลดลง 2 เท่าเดิม 3 สูงขึ้น	193TT การเปลี่ยนแปลงหลังจากได้รับการรับรอง	1 ลดลง	2 เท่าเดิม	3 สูงขึ้น		
ส่วนที่ IV: ความผิดเห็นเกี่ยวกับระบบรับรอง เหตุผลที่เข้าร่วมระบบรับรอง: 194 เหตุผลที่เข้าร่วมระบบรับรอง 194A แนะนำโดยตรมประมง 1 ใช่ 2 ไม่ใช่ 194B แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยสหรมที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เชล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื่อต่างประเทศ (กรณีชื่อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื่อต่างประเทศ (กรณีชื่อตรง) 1 ใช่ 2 ไม่ใช่ 195 ก่อนที่เข้าร่วมระบบรับรอง 1 ใช่ 2 ไม่มี 195A การตรวจจุดุณภาพลูกกุ้ง 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจจัดคุณภาพน้ำก่อนก้าง 1 มี 2 ไม่มี	•	บาท				
เหตุผลที่เข้าร่วมระบบรับรอง 194 เหตุผลที่เข้าร่วมระบบรับรอง 1 ใช่ 2 ไม่ใช่ 1 194A แนะนำโดยกรมประมง 1 ใช่ 2 ไม่ใช่ 1 194B แนะนำโดยชมรม/สมาคมผู้เลี้ยงกุ้ง 1 ใช่ 2 ไม่ใช่ 1 194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 1 194Dเป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 1 194E แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 1 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 1 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 1 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 1 194J ร้องขอจากผู้ซื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 1 194J ร้องขอจากโรงงานแปรรูป (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 1 195A การตรวจคุณภาพลูกกุ้ง 1 มี 2 ไม่มี 1 195C การนำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 1 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 2 ไม่มี 1 195E การตรวจวัดคุณภาพน้ำก่อนกำ 1 มี 2 ไม่มี 2 ไม่มี 1		1 ลดลง	2 เท่าเดิม	3 สูงขึ้น		
194 เหตุผลที่เข้าร่วมระบบรับรอง 194A แนะนำโดยกรมประมง 1 ใช่ 2 ไม่ใช่ 194B แนะนำโดยชมรม/สมาคมผู้เลี้ยงกุ้ง 1 ใช่ 2 ไม่ใช่ 194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยเพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดยเพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากโรงงานแปรรูป (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 195A การตรวจรับรอง: 195 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั่ง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั่ง	ส่วนที่ IV: ความคิดเห็นเกี่ยวกับระบบรับรอง					
1 ใช่ 2 ไม่ใช่ 194A แนะนำโดยตรมประมง 1 ใช่ 2 ไม่ใช่ 194B แนะนำโดยตรมรม/สมาคมผู้เลี้ยงกุ้ง 1 ใช่ 2 ไม่ใช่ 194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194D เป็นช้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื่อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื่อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 195A การตรวจรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำกัง 1 มี 2 ไม่มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำกัง	เหตุผลที่เข้าร่วมระบบรับรอง:					
194B แนะนำโดยชมรม/สมาคมผู้เลี้ยงกุ้ง 1 ใช่ 2 ไม่ใช่ 194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 195J ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจจุณภาพลูกกุ้ง 1 มี 2 ไม่มี 195B การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำกัง 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำก็ง 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำกัง 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำกัง 1 มี 2 ไม่มี 195D การตรวจจัดคุณภาพน้ำที่ง	194 เหตุผลที่เข้าร่วมระบบรับรอง					
194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า) 1 ใช่ 2 ไม่ใช่ 194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดย ตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ซื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ซื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 195B ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั้ง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั้ง			1 ใช่	2 ไม่ใช่		
194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์ 1 ใช่ 2 ไม่ใช่ 194E แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว 1 ใช่ 2 ไม่ใช่ 194F แนะนำโดยแพ/พ่อค้าคนกลาง 1 ใช่ 2 ไม่ใช่ 194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดย ตัวแทนจำหน่าย (เซล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 195J ก่อนที่เข้าร่วมระบบรับรอง: 195 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจจัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั้ง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทั้ง	194B แนะนำโดยชมรม/สมาคมผู้เลี้ยงกุ้ง		1 ใช่	2 ไม่ใช่		
1 ใช่ 2 ไม่ใช่	194C แนะนำโดยสหกรณ์ (ไม่ได้บังคับให้เข้า)		1 ใช่	2 ไม่ใช่		
1 ใช่ 2 ไม่ใช่	194D เป็นข้อกำหนดของการสมัครสมาชิกสหกรณ์		1 ใช่	2 ไม่ใช่		
194G แนะนำโดย CP 1 ใช่ 2 ไม่ใช่ 194H แนะนำโดยตัวแทนจำหน่าย (เชล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ชื่อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากโรงงานแปรรูป (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ วิธีปฏิบัติก่อนเข้าร่วมระบบรับรอง:	194E แนะนำโดยฟาร์มที่ได้รับการรับรองแล้ว		1 ใช่	2 ไม่ใช่		
194H แนะนำโดยตัวแทนจำหน่าย (เชล หรือร้านค้า) 1 ใช่ 2 ไม่ใช่ 194I ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากโรงงานแปรรูป (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ วิธีปฏิบัติก่อนเข้าร่วมระบบรับรอง:	194F แนะนำโดยแพ/พ่อค้าคนกลาง		1 ใช่	2 ไม่ใช่		
194I ร้องขอจากผู้ชื้อต่างประเทศ (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ 194J ร้องขอจากโรงงานแปรรูป (กรณีชื้อตรง) 1 ใช่ 2 ไม่ใช่ วิธีปฏิบัติก่อนเข้าร่วมระบบรับรอง:	194G แนะนำโดย CP		1 ใช่	2 ไม่ใช่		
1 ใช่ 2 ไม่ใช่	194H แนะนำโดยตัวแทนจำหน่าย (เซล หรือร้านค้า)		1 ใช่	2 ไม่ใช่		
วิธีปฏิบัติก่อนเข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 195A การตรวจคุณภาพลูกกุ้ง 1 มี 2 ไม่มี 195B การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	194I ร้องขอจากผู้ซื้อต่างประเทศ (กรณีซื้อตรง)		1 ใช่	2 ไม่ใช่		
195 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดการฟาร์มต่อไปนี้หรือไม่ 1 195A การตรวจคุณภาพลูกกุ้ง 1 มี 2 ไม่มี 195B การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	_		1 ใช่	2 ไม่ใช่		
195A การตรวจคุณภาพลูกกุ้ง 1 มี 2 ไม่มี 195B การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	วิธีปฏิบัติก่อนเข้าร่วมระบบรับรอง:					
195B การตรวจวัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	195 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการจัดก	ารฟาร์มต่อไร	ไนี้หรือไม่			
195C การบำบัดคุณภาพน้ำก่อนเข้า 1 มี 2 ไม่มี 195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	195A การตรวจคุณภาพลูกกุ้ง		1 มี	2 ไม่มี		
195D การตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง 1 มี 2 ไม่มี 195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	195B การตรวจวัดคุณภาพน้ำก่อนเข้า		1 มี	2 ไม่มี		
195E การตรวจวัดคุณภาพน้ำทิ้ง 1 มี 2 ไม่มี	195C การบำบัดคุณภาพน้ำก่อนเข้า		1 มี	2 ไม่มี		
	195Dการตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง		1 มี	2 ไม่มี		
195F การบำบัดน้ำทิ้ง 1 มี 2 ไม่มี	195E การตรวจวัดคุณภาพน้ำทิ้ง		1 มี	2 ไม่มี		
	195F การบำบัดน้ำทิ้ง		1 มี	2 ไม่มี		



195Gการบำบัดตะกอนเลน	1 มี	2 ไม่มี			
195Hวิธีการใช้สารเคมี (เช่น ไม่ใช้ในการป้องกันแต่ใช้ในการรักษา หรือ ไม่ใช้สารเคมีต้องห้าม)	1 มี	2 ไม่มี			
195I ห้องเก็บสารเคมี	1 มี	2 ไม่มี			
195J การใช้อาหารที่มีคุณภาพ	1 มี	2 ไม่มี			
195K ห้องเก็บอาหาร	1 มี	2 ไม่มี			
195L มาตรการความปลอดภัยอาหาร (เช่น ระยะห่างของห้องน้ำ และบ่อเลี้ยง สัตว์เลี้ยง ระบบกำจัดขยะ)	1 มี	2 ไม่มี			
195M การตรวจสุขภาพ/อัตราการเติบโตกุ้ง	1 มี	2 ไม่มี			
195N มาตรการควบคุมเมื่อเกิดโรค	1 มี	2 ไม่มี			
1950 มาตรการจัดการเมื่อกุ้งตาย	1 มี	2 ไม่มี			
195P มาตรการควบคุมคนเข้า-ออกฟาร์ม	1 มี	2 ไม่มี			
196 ก่อนที่เข้าร่วมระบบรับรอง ฟาร์มมีระบบการบันทึกข้อมูลและเอ	กสารต่อไปเ	์ เ้หรือไม่			
196A คู่มือฟาร์ม	1 มี	2 ไม่มี			
196B เอกสารสิทธิ์ที่ดิน (โฉนดหรือสัญญาเช่า)	1 มี	2 ไม่มี			
196C บันทึกอัตราการปล่อย	1 มี	2 ไม่มี			
196D บันทึกปริมาณอาหารที่ใช้	1 มี	2 ไม่มี			
196E คำนวณค่า FCR	1 มี	2 ไม่มี			
196F บันทึกการใช้น้ำ (น้ำเข้า-น้ำออก)	1 มี	2 ไม่มี			
196G บันทึกคุณภาพน้ำระหว่างการเลี้ยง	1 มี	2 ไม่มี			
196H บันทึกคุณภาพน้ำทิ้ง	1 มี	2 ไม่มี			
196I บันทึกการใช้พลังงาน	1 มี	2 ไม่มี			
196J บันทึกจำนวนชนิดของพืชและสัตว์ภายในฟาร์ม	1 มี	2 ไม่มี			
196K เอกสาร MD	1 มี	2 ไม่มี			



วิธีปฏิบัติหลังเข้าร่วมระบบรับรอง:					
197 หลังการเข้าร่วมระบบรับรองมีการเปลี่ยนแปลงระบบการจัดการพ	lาร์มอะไรบ้า	างต่อไปนี้			
197A การตรวจคุณภาพลูกกุ้ง	1 ใช่	2 ไม่ใช่			
197B การตรวจวัดคุณภาพน้ำก่อนเข้า	1 ใช่	2 ไม่ใช่			
197C การบำบัดคุณภาพน้ำก่อนเข้า	1 ใช่	2 ไม่ใช่			
197Dการตรวจวัดคุณภาพน้ำระหว่างการเลี้ยง	1 ใช่	2 ไม่ใช่			
197E การตรวจวัดคุณภาพน้ำทิ้ง	1 ใช่	2 ไม่ใช่			
197F การบำบัดน้ำทิ้ง	1 ใช่	2 ไม่ใช่			
197G การบำบัดตะกอนเลน	1 ใช่	2 ไม่ใช่			
197Hวิธีการใช้สารเคมี (เช่น ไม่ใช้ในการป้องกันแต่ใช้ในการรักษา หรือ ไม่ใช้สารเคมีต้องห้าม)	1 ใช่	2 ไม่ใช่			
1971 ห้องเก็บสารเคมี	1 ใช่	2 ไม่ใช่			
197J การใช้อาหารที่มีคุณภาพ	1 ใช่	2 ไม่ใช่			
197K ห้องเก็บอาหาร	1 ใช่	2 ไม่ใช่			
197L มาตรการความปลอดภัยอาหาร (เช่น ระยะห่างของห้องน้ำ และบ่อเลี้ยง สัตว์เลี้ยง ระบบกำจัดขยะ)	1 ใช่	2 ไม่ใช่			
197M การตรวจสุขภาพ/อัตราการเติบโตกุ้ง	1 ใช่	2 ไม่ใช่			
197N มาตรการควบคุมเมื่อเกิดโรค	1 ใช่	2 ไม่ใช่			
1970 มาตรการจัดการเมื่อกุ้งตาย	1 ใช่	2 ไม่ใช่			
197P มาตรการควบคุมคนเข้า-ออกฟาร์ม	1 ใช่	2 ไม่ใช่			
198 หลังการเข้าร่วมระบบรับรองมีการเปลี่ยนแปลงระบบการบันทึกข้า อะไรบ้าง	า อมูลและเอก	าสาร			
198A คู่มือฟาร์ม	1 ใช่	2 ไม่ใช่			
198B เอกสารสิทธิ์ที่ดิน (โฉนดหรือสัญญาเช่า)	1 ใช่	2 ไม่ใช่			
198C บันทึกอัตราการปล่อย	1 ใช่	2 ไม่ใช่			



198D บันทึกปริมาณอาหารที่ใช้	1 ใช่	2 ไม่ใช่		
198E คำนวณค่า FCR	1 ใช่	2 ไม่ใช่		
198F บันทึกการใช้น้ำ (น้ำเข้า-น้ำออก)	1 ใช่	2 ไม่ใช่		
198G บันทึกคุณภาพน้ำระหว่างการเลี้ยง	1 ใช่	2 ไม่ใช่		
198H บันทึกคุณภาพน้ำทิ้ง	1 ใช่	2 ไม่ใช่		
198I บันทึกการใช้พลังงาน	1 ใช่	2 ไม่ใช่		
198J บันทึกจำนวนชนิดของพืชและสัตว์ภายในฟาร์ม	1 ใช่	2 ไม่ใช่		
198K เอกสาร MD	1 ใช่	2 ไม่ใช่		
198L ได้ลูกกุ้งคุณภาพดี	1 ใช่	2 ไม่ใช่		
198M ไม่มีสัตว์พาหะติดมากับน้ำเข้า	1 ใช่	2 ไม่ใช่		
198N ปริมาณการใช้น้ำลดลง	1 ใช่	2 ไม่ใช่		
1980 ปริมาณน้ำที่ปล่อยทิ้งจากฟาร์มลดลง	1 ใช่	2 ไม่ใช่		
198P บำบัดน้ำเสียก่อนจะทำการปล่อยออก	1 ใช่	2 ไม่ใช่		
198Q ตรวจวัดคุณภาพน้ำทิ้งก่อนปล่อยออก	1 ใช่	2 ไม่ใช่		
198R ปฏิบัติตามมาตรฐานน้ำทิ้ง	1 ใช่	2 ไม่ใช่		
198S คุณภาพน้ำในธรรมชาติดีขึ้น	1 ใช่	2 ไม่ใช่		
198T ปริมาณการใช้สารเคมีลดลง	1 ใช่	2 ไม่ใช่		
198U ปริมาณการใช้ยาลดลง	1 ใช่	2 ไม่ใช่		
198V ไม่มีปัญหาสารเคมีตกค้าง	1 ใช่	2 ไม่ใช่		
198W ไม่มีปัญหาการปนเปื้อน	1 ใช่	2 ไม่ใช่		
198X การติดเชื้อและเกิดโรคลดลง	1 ใช่	2 ไม่ใช่		
198Y ไม่มีข้อร้องเรียนปัญหาสิ่งแวดล้อม	1 ใช่	2 ไม่ใช่		
199 คุณมีความคิดเห็นอย่างไรกับข้อกำหนดทางสิ่งแวดล้อมเหล่านี้	 			
199A นโยบายสิ่งแวดล้อม 1 เห็นด้วย 2 ไม่เห็นด้	้วย (เพราะ)		



199B สถานที่ตั้งฟาร์มอยู่ห่างจาก แหล่งมลพิษ	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199C สถานที่ตั้งฟาร์มไม่อยู่ในป่าชาย เลน	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199D การอนุรักษ์ความหลากหลาย ทางชีวภาพ	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199E การกำหนดอัตราปล่อย	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199F การจัดการสารเคมี	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199G การลดปริมาณน้ำเสียที่ปล่อยทิ้ง	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199H การบำบัดน้ำทิ้ง	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
1991 การตรวจคุณภาพน้ำทิ้ง	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
1991 การปฏิบัติตามมาตรฐานน้ำทิ้ง	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199K การจัดการดินตะกอน	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199L การจัดการขยะ	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199M ระบบการบันทึกข้อมูล	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
199N ระบบตรวจสอบย้อนกลับ	1 เห็นด้วย	2 ไม่เห็นด้วย (เพราะ)			
การปฏิบัติให้สอดคล้องกับเกณฑ์ข้อกำ	าหนดของระเ	บบรับรอง:			
200 เป็นการยากหรือง่ายอย่างไรในการ	ปฏิบัติตามข้อ	กำหนดทางสิ่งแวดล้อมเหล่านี้			
200A การมีนโยบายเกี่ยวกับสิ่งแวดล้อม	เในสมุดคู่มือา	ฟาร์ม			
1. ปฏิบัติอยู่แล้ว	2.	ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4.	ทำไม่ได้ (เพราะ)			
)					
200B สถานที่ตั้งฟาร์มอยู่ห่างจากแหล่ง	มลพิษ				
1. ปฏิบัติอยู่แล้ว	2.	ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4.	ทำไม่ได้ (เพราะ)			
<u> </u>					



)				
200C สถานที่ตั้งฟาร์มไม่อยู่ในป่าชายเลน				
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				
200D การอนุรักษ์ความหลากหลายทางชีวม	าาพ			
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				
200E การกำหนดอัตราปล่อย				
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				
200F การจัดการสารเคมี	•			
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				
200G การลดปริมาณน้ำเสียที่ปล่อยทิ้ง				
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				
200H การบำบัดน้ำก่อนปล่อยทิ้ง	•			
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)			
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)			
)				



200I การตรวจคุณภาพน้ำทิ้ง					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
200J การลดการใช้พลังงาน					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
200K การจัดการตะกอนเลน					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				-
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
200L การจัดการขยะ					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
200M การปฏิบัติตามมาตรฐานน้ำทิ้ง					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
200N ระบบการบันทึกข้อมูลและเอกสาร					
1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)				
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)				
)					
2000 ระบบตรวจสอบย้อนกลับ					
		•		 	



1. ปฏิบัติอยู่แล้ว	2. ทำได้ง่าย (เพราะ)		
3. ทำได้ยาก (เพราะ	4. ทำไม่ได้ (เพราะ)		
)			
ค่าใช้จ่ายในการปรับปรุงฟาร์มเพื่อให้ผ่า			
201 ค่าใช้จ่ายเพื่อปรับปรุงฟาร์มในเรื่องต่			
201A รั้วฟาร์ม			
201B ที่พักคนงาน	บาท		
201C ที่กินข้าว	บาท		
201D ห้องน้ำ	บาท		
201E ห้องเก็บสารเคมี	บาท		
201F ห้องสำนักงาน	บาท		
202 ค่าใช้จ่ายเพื่อปรับปรุงระบบการบันทึก	ข้อมูล		
บาท			
203 ค่าใช้จ่ายเพื่อปรับปรุงระบบการตรวจส	สอบ/ติดตามบาท		
ค่าใช้จ่ายสำหรับการรักษา/ต่ออายุใบรับ	รอง:		
204 การปรับปรุงสิ่งอำนวยความสะดวกขอ	งฟาร์ม (โปรดระบุรายละเอียดการปรับปรุง)		
204A รั้วฟาร์ม	บาท		
204B ที่พักคนงาน	บาท		
204C ที่กินข้าว	บาท		
204D ห้องน้ำ	บาท		
204E ห้องเก็บสารเคมี	บาท		
204F ห้องสำนักงาน			
205 ค่าใช้จ่ายเพื่อรักษาระบบการบันทึกข้อ	มูล		
บาท			
206 ค่าใช้จ่ายเพื่อรักษาระบบการตรวจสอง	J/ติดตามบาท		



การเปลี่ยนแปลงกับคนงานที่เกิดจากการเ	ข้าร่วมระบบรับรอง:					
207 การได้มาซึ่งใบรับรองให้ประโยชน์ทางต่						
207A ค่าจ้างตามกฎหมายแรงงาน	1 ใช่ (อธิบาย	2 ไม่ใช่				
207B สัญญาการจ้างงานชัดเจน	1 ใช่ (อธิบาย)	2 ไม่ใช่			
207C ที่อยู่อาศัยปรับปรุงดีขึ้น	1 ใช่ (อธิบาย)	2 ไม่ใช่			
207D สุขภาพได้รับการดูแลดีขึ้น	1 ใช่ (อธิบาย)	2 ไม่ใช่			
207E ความปลอดภัยในที่ทำงานดีขึ้น	1 ใช่ (อธิบาย)	2 ไม่ใช่			
207F ความสัมพันธ์กับเจ้าของฟาร์มดีขึ้น	1 ใช่ (อธิบาย	2 ไม่ใช่				
207G ไม่มีข้อร้องเรียนจากชุมชน	1 ใช่ (อธิบาย	2 ไม่ใช่				
1.2 อุปสรรคในการขอการรับรอง:						
208 ปัจจัยใดที่ทำให้ท่านได้รับใบรับรองฟา ^ง						
208A การทำงานล่าช้าของหน่วยงานที่เกี่ยวข้อง 1 ใช่						
208B ขั้นตอนการขอใบรับรองยุ่งยาก 1 ใช่			2 ไม่ใช่			
208C คนกลางอยากได้ค่าตอบแทน 1 ใช่		1 ใช่	2 ไม่ใช่			
208D อื่น ๆ, โปรดระบุ		1				
209 ปัจจัยใดที่ช่วยให้ท่านได้รับใบรับรองฟ	าร์มง่าย					
209A มีเพื่อนหรือญาติที่ทำงานในหน่วยงาง	เของกรมประมง	1 ใช่	2 ไม่ใช่			
209B มีเพื่อนหรือญาติที่ทำงานใน อบต. ห	รือ อำเภอ	1 ใช่	2 ไม่ใช่			
209C มีเพื่อนหรือญาติเป็นผู้ใหญ่บ้าน 1 ใช่			2 ไม่ใช่			
209D อื่น ๆ, โปรดระบุ						
210 ก่อนที่จะขอใบรับรอง ท่านได้รับข้อมูล	หรือคำแนะนำจากบุคคลใด	บ้าง				
210A เจ้าของฟาร์มกุ้งอื่นที่มีใบรับรองแล้ว		1 ใช่	2 ไม่ใช่			
210B สหกรณ์/ชมรม		1 ใช่	2 ไม่ใช่			



<u> </u>						1	
210C เจ้าหน้าที่จากกรมประมง			1 ใช่	2 ไม่ใช่			
210D บริษัทเจริญโภคภัณฑ์ (C.P.)			1 ใช่	2 ไม่ใช่			
210E โรงงานแปรรูปที่ขายกุ้งให้เป็นประจำ			1 ใช่	2 ไม่ใช่			
		ื่อข้อมูลจาก	าบุคค	ลในกลุ่มใด			
211A เจ้าของฟาร์มกุ้งอื่นที่มีใบรับรองแล้ว			1 ใช่	2 ไม่ใช่			
211B สหกรณ์/ชมรม			1 ใช่	2 ไม่ใช่			
211C เจ้าหน้าที่จากกรมประมง			1 ใช่	2 ไม่ใช่			
211D บริษัทเจริญโภคภัณฑ์ (C.P.)			1 ใช่	2 ไม่ใช่			
211E โรงงานแปรรูปที่ขายกุ้งให้เป็นประจำ			1 ใช่	2 ไม่ใช่			
212 ท่านมีปัญหาและอุปสรรคด้านเศรษฐกิจใน	การขอใบรับรอ	เงอย่างไร					
212A ค่าใช้จ่ายในการปรับปรุงฟาร์ม			1 ใช่	2 ไม่ใช่			
212B ค่าใช้จ่ายในการพัฒนาระบบการบันทึกข้อมูลและเอกสาร			1 ใช่	2 ไม่ใช่			
212C ราคาขายกุ้งเท่าเดิม			1 ใช่	2 ไม่ใช่			
	สิ่งที่เกิดขึ้นจริง	:					
213 ความเสี่ยงของความล้มเหลวในการผลิต							
213A ความคาดหวัง	1 ต่ำลง	2 เท่าเ	ดิม	3 สูงขึ้น			
213B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเ	ดิม	3 สูงขึ้น			
	 าจัยการผลิต						
214A ความคาดหวัง	1 ต่ำลง 2 เท่า			3 สูงขึ้น			
214B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเ	ดิม	3 สูงขึ้น			
215 ข้อกำหนดทางการตลาด							
215A ความคาดหวัง	1 ต่ำลง	2 เท่าเ	ดิม	3 สูงขึ้น			
215B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเ	ดิม	3 สูงขึ้น			
216 โอกาสทางการตลาด							



216A ความคาดหวัง	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				
216B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				
217 ราคาขาย							
217A ความคาดหวัง	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				
217B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				
218 ปริมาณความต้องการของตลาด/ยอดขาย							
218A ความคาดหวัง	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				
218B สถานการณ์จริง/ประสบการณ์	1 ต่ำลง	2 เท่าเดิม	3 สูงขึ้น				



Appendix 3: In-depth interview guideline

In-depth interview: Shrimp Grower Association

- 1. ช่วยเล่าประวัติความเป็นมาของฟาร์มกุ้งของท่าน, สมาคมกุ้งของท่านทำอะไรบ้าง
- 1A มีสมาชิกทั้งหมดกี่คน, องค์กรเริ่มเมื่อไหร่, ดูแลพื้นที่บริเวณใดบ้าง
- 1B ใครเป็นนายยกสมาคม, มีหน้าที่อะไร
- 1C ในระยะเวลา 1 ปี ที่ผ่านมา องค์กรของท่านได้จัดงานหรือกิจกรรมอะไรบ้าง
- 1D ท่านเคยได้รับเชิญให้ร่วมแก้ปัญหาของเกษตรกรหรือไม่
- 1E ทุนของสมาคมนำมาใช้ในกิจกรรมต่าง ๆอย่างไร
- 1F ผลที่ดีที่สุดที่องค์กรของท่านได้ทำในบริเวณนี้คืออะไร
- 2. ท่านมีความคิดเห็นอย่างไรเกี่ยวกับใบรับรองฟาร์มกุ้งที่แตกต่างกัน ท่านมีความเห็น อย่างไรเกี่ยวกับกฎเกณฑ์ที่แตกต่างกันในแต่ละระบบรับรอง
- 2A ท่านรู้หรือไม่ว่าใบรับรองต่าง ๆ ได้มาอย่างไร
- 2B มาตรฐานใดง่ายที่สุดในการทำให้ฟาร์มของท่านมีความสำเร็จ
- 2C มาตรฐานใดยากที่สุดในการทำให้ฟาร์มของท่านมีความสำเร็จ, มาตรฐานใดที่ทำให้ท่านต้องมี การเปลี่ยนแปลงระบบการจัดการมากที่สุด
- 2D ในความคิดเห็นของท่านส่วนใดของใบรับรองยากที่จะเข้าใจ, กฎเกณฑ์ใดในมาตรฐานที่ยาก แก่การทำความเข้าในหรือเห็นด้วย
- 2E กฎข้อบังคับใดในมาตรฐานที่ท่านไม่เห็นด้วย
- 3. หลังจากที่ได้รับใบรับรองแล้วมีผลกระทบทางด้านใดบ้าง...มีผลอะไรตามมาหลังจากที่ ท่านได้การรับรองมาตรฐาน
- 3A ในด้านทักษะการจัดการธุรกิจ
- 3B ในส่วนความสัมพันธ์ระหว่างผู้ซื้อและราคาขาย
- 3C องค์กรต่าง ๆให้ความช่วยเหลืออย่างไรบ้างในการรับใบรับรอง
- 4. หน่วยงานใดที่องกรค์ของท่านมีการติดต่อเกี่ยวกับระบบรับรองมาตรฐาน
- 4A องค์กรของท่าน เคยถูกขอความช่วยเหลือในการจัดประชุมหรือไม่
- 4B ท่านเคยเชิญผู้สนใจไหม, พวกเขาต้องการรู้อะไร, ท่านทำอะไรเพื่อตอบสนองความต้องการ ของผู้เข้าร่วมประชุม
- 4C ท่านเคยเข้าร่วมในการประชุมเกี่ยวกับใบรับรองหรือไม่
- 5. การเติบโตของฟาร์มกุ้งส่งผลกระทบให้คนที่อาศัยในท้องถิ่นอย่างไรบ้าง
- 5A ช่วยยกตัวอย่างผลดีและผลเสียของการทำฟาร์มกุ้ง มีอะไรบ้าง
- 5B ท่านหรือครอบครัวของท่านเคยมีฟาร์มกุ้งหรือไม่



- 5C การที่มีใบรับรองเข้ามาทำให้มีการเปลี่ยนแปลงหรือไม่
- 6. ฟาร์มกุ้งในบริเวณนี้ส่งผลกระทบกับสิ่งแวดล้อมที่ท่านพอมองเห็นหรือไม่ ช่วย ยกตัวอย่าง
- 6A การเปลี่ยนแปลงเหล่านี้ส่งผลกระทบให้ผู้ที่พักอาศัยในบริเวณนี้หรือไม่ อย่างไร
- 6B การที่มีใบรับรองเข้ามาทำให้มีการเปลี่ยนแปลงหรือไม่
- 7. ในปีที่ผ่านมาโดยความสัมพันธ์ระหว่างฟาร์มกับชุมชนในท้องถิ่น ทางฟาร์มนั้นมีการ เปลี่ยนแปลงไปในทางที่ทำให้เกิดความสำคัญแก่ชุมชนท้องถิ่น หรือไม่อย่างไร
- 8. ประเด็นอะไรบ้างที่ทำให้ท่านเชื่อว่าต้องมาเป็นข้อปฏิบัติของสมาคม
- 8A กฎหรือข้อปฏิบัติเหล่านั้นมีความแตกต่างกับกฎหรือข้อปฏิบัติในปัจจุบันอย่างไร
- 8B ความต้องการอะไรที่ท่านคิดว่าต้องมีการเปลี่ยนแปลงข้อปฏิบัติ(ถ้าจำเป็น)
- 9. ท่านมองเห็นการพัฒนาอุตสาหกรรมการเลี้ยงกุ้งที่อยู่ภายใต้องค์กรท่านอีก 10 ปี ข้างหน้าว่าเป็นอย่างไรบ้าง
- 10. ท่านมีข้อเสนอแนะในแบบสอบถามบ้างไหม



In-depth interview: Hatchery

- 1. ภูมิหลัง
- 1A ท่านมีการประกอบธุรกิจโรงเพาะฟักมาเป็นระยะเวลาเท่าไร?
- 1B เดิมพื้นที่บริเวณนี้เป็นอะไร? ท่านมีเอกสารสิทธิ์แบบใด?
- 2. ความรู้เกี่ยวกับระบบรับรองมาตรฐานกุ้ง
- 2A ท่านทราบหรือไม่ว่ามีมาตรฐานใดบ้างที่เกี่ยวกับโรงเพาะฟัก?
- 2B ท่านทราบอะไรบ้างเกี่ยวกับมาตรฐานโรงเพาะฟัก?
- 3. การจัดการระบบในโรงเพาะฟัก?
- 3A โรงเพาะของท่านเคยเพาะกุ้งชนิดใดบ้างจนถึงปัจจุบัน? ในกรณีที่เปลี่ยนชนิดของกุ้งเกิดจาก เหตุผลอะไร?
- 3B ท่านใช้พ่อแม่พันธุ์กุ้งจากแหล่งใด? มีการตรวจโรคหรือไม่? มีการจดบันทึกถึงแหล่งที่มาและ การตรวจโรคหรือไม่?
- 3C ท่านมีการจัดการกับคุณภาพลูกพันธุ์ที่ผลิตได้จากฟาร์มอย่างไร? มีการจดบันทึกสุขภาพลูก กุ้งและคุณภาพน้ำหรือไม่?
- 3D ท่านทราบอะไรเกี่ยวกับมาตรฐานในการจัดการระบบน้ำที่ใช้ในโรงเพาะ?
- 3E ท่านทราบหรือไม่ว่ามีมาตรการเกี่ยวกับระบบการจัดการขยะและระบบสุขาภิบาลในโรงเพาะ ฟัก?
- 3F ท่านคิดว่ามีความยากง่ายอย่างไรในการปรับปรุงเพื่อเข้าสู่ระบบรับรอง?
- 3G ท่านคิดว่าเกณฑ์ใดบ้างที่ไม่เหมาะสมสำหรับโรงเพาะฟัก? ทำไม?
- 4. การสมัครเพื่อรับการรับรอง
- 4A อะไรคือเหตุผลของท่านเพื่อเข้าร่วมระบบรับรองมาตรฐาน?
- 4B ท่านคิดว่าอะไรเป็นอุปสรรคสำคัญต่อการขอใบรับรอง?
- 5. ผลที่ได้รับจากการสมัครเข้าร่วมการรับรองมาตรฐาน
- 5A การเข้าร่วมการรับรองมาตรฐานมีส่วนให้เกิดการเปลี่ยนแปลงต่อการจัดการระบบภายในโรง เพาะฟักหรือไม่? อย่างไร?
- 5B ท่านได้รับประโยชน์ในด้านใดบ้างจากการได้รับรองมาตรฐาน?



In-depth interview: Feed mill

- 1 ความรู้เกี่ยวกับระบบรับรองมาตรฐานกุ้ง
- 1A ท่านทราบอะไรบ้างเกี่ยวกับมาตรฐานกุ้ง?
- 1B ท่านทราบหรือไม่ว่ามีเกณฑ์ใดบ้างที่เกี่ยวกับอาหารเลี้ยงกุ้ง?
- 1C ท่านมีมุมมองอย่างไรเกี่ยวกับมาตรฐานการรับรองที่เฉพาะเจาะจงของอาหารเลี้ยงกุ้ง?
- 1D ท่านมีการจดบันทึกส่วนผสมของอาหารเลี้ยงกุ้งจาก suppliers ในช่วง 3 ปีที่ผ่านมาหรือไม่?
- 1E ท่านมีการตรวจสอบการปนเปื้อนของอาหารเลี้ยงกุ้งหรือไม่?
- 1F ท่านมีการแจ้งถึงส่วนผสมของอาหารเลี้ยงกุ้งหรือไม่?
- 1G ท่านแจ้งข้อมูลใดบ้างบนฉลากของผลิตภัณฑ์อาหาร? แหล่งของปลาป่นมาจากที่ไหน? ท่าน ชื้อปลาป่นจากใคร? ท่านทราบหรือไม่ว่าปลาป่นนำมาจากการจับจากปลาทะเลและเริ่มมีการ จับปลาจากแหล่งธรรมชาติมากจนเกินไป ท่านทราบหรือไม่ว่าอะไรเป็นปัจจัยสำคัญของหัวข้อ ในมาตรฐานเกี่ยวกับการใช้ปลาป่น
- 1H ท่านคิดว่ามีความยากง่ายอย่างไรในการปรับตัวเพื่อเข้าสู่ระบบรับรอง?
- 1I ท่านคิดว่าเกณฑ์ใดบ้างที่ไม่เหมาะสมสำหรับการโรงงานผลิตอาหารเลี้ยงกุ้ง? ทำไม?
- 1.1 การสมัครเพื่อรับการรับรอง
- 1K มีความต้องการใดบ้างจากผู้ผลิต/ผู้แปรรูป/ผู้ซื้อ สำหรับอาหารเลี้ยงกุ้งเพื่อใช้ในระบบ รับรอง?
- 1L อะไรคือเหตุผลของท่านเพื่อเข้าร่วมระบบรับรองมาตรฐาน?
- 1M ผลที่ได้รับจากการสมัครเข้าร่วมการรับรองมาตรฐาน
- 1N มีผลกระทบใดบ้างที่เกิดกับอาหารเลี้ยงกุ้งเมื่อเข้าร่วมการรับรองมาตรฐาน?
- 10 การเข้าร่วมการรับรองมาตรฐานนี้จะทำให้มีต้นทุนการผลิตที่สูงขึ้นหรือไม่?
- 1P การเข้าร่วมการรับรองมาตรฐานนี้จะทำให้มีราคาอาหารกุ้งที่เพิ่มขึ้นหรือไม่?



In-depth interview: Processing plant

- 1 ข้อมูลภูมิหลัง
- 1A ท่านมีวิธีการในการตัดสินใจชื้อกุ้งอย่างไร? (ทำสัญญาล่วงหน้ากับฟาร์ม, ประมูลจากแพกุ้ง, ชื้อจากปากบ่อ)
- 1B การผลิตกุ้งคือกระบวนการผลิตหลักของท่าน?
- 1C ผลิตภัณฑ์กุ้งแบบใดที่ท่านส่งจำหน่ายยังต่างประเทศมากที่สุด?
- 1D ผู้ค้าหลักของท่านคือใคร?
- 2 ความรู้เกี่ยวกับระบบรับรองมาตรฐานกุ้ง
- 2A ท่านส่งคณะทำงานจากบริษัทไปทำการจับกุ้งที่ฟาร์มหรือไม่?
- 2B ท่านมีการมอบหมายหน้าที่ให้ใครเป็นผู้ไปควบคุมฟาร์มในช่วงระหว่างการจับกุ้ง?
- 2C ท่านมีการให้ข้อมูลที่เกี่ยวกับวิธีที่ใช้ในการจับกุ้งแก่ทางฟาร์มหรือไม่?
- 2D ท่านมีการให้ข้อมูลที่เกี่ยวกับวิธีการควบคุมท่านภาพ (HACCP) ภายหลังจากขั้นตอนการจับ กุ้งและขั้นตอนการขนส่งมายังโรงงานแปรรูปหรือไม่?
- 3 ความเกี่ยวเนื่องกับฟาร์ม
- 3A ในกรณีที่มีการซื้อกุ้งจากปากบ่อท่านมีวิธีการเลือกฟาร์มอย่างไร
- 3B ท่านมีการเข้าร่วมทำสัญญาซื้อขายล่วงหน้ากับฟาร์มหรือไม่
- 3C ท่านมีขั้นตอนอย่างไร
- 3D ท่านมีประสบการณ์อย่างไรในการทำสัญญาซื้อขายล่วงหน้ากับฟาร์ม? ฟาร์มที่ท่านทำสัญญา ซื้อขายด้วยมีชื่อเสียงหรือไม่
- 3E ท่านมีการใช้ระบบมาตรฐานต่าง ๆจากที่ใดในการตัดสินใจชื้อกุ้ง? ถ้าใช้, ใช้อย่างไร
- 3F ท่านมีมาตรฐานเป็นของตัวเองในการเลือกซื้อกุ้งหรือไม่? ท่านใช้มาตรฐานอะไร?
- 3G ท่านมีการตรวจสอบความสามารถของฟาร์มอย่างไร
- 4 ความเกี่ยวเนื่องกับผู้ซื้อและผู้บริโภค
- 4A ท่านมีการขายผลิตภัณฑ์หลังจากเสร็จสิ้นกระบวนการผลิตแล้วแก่ผู้บริโภคอย่างไร(ขายตรง ให้กับผู้ค้าปลีก หรือ ผ่านทางผู้ซื้อ)
- 4B ท่านมีการทำสัญญาชื้อขายล่วงหน้าหับผู้ชื้อ/ผู้ค้าปลีกหรือไม่
- 4C ท่านมีวิธีอย่างไร
- 4D ท่านมีประสบการณ์ในการทำสัญญาซื้อขายล่วงหน้าหรือไม่? ผู้ค้ามีชื่อเสียงหรือไม่
- 4E ท่านมีการใช้มาตรฐานในการเจรจาการค้าหรือไม่? ถ้าใช้ใช้อย่างไร
- 5 ท่านมีมุมองอย่างไรเกี่ยวกับ ข้อกำหนดมาตรฐานเฉพาะเจาะจงของกระบวนการแปรรูป กุ้ง?
- 5A ปัจจุบันท่านได้เข้าสู่ระบบรับรองแล้วหรือไม่?

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



5B	ถ้ายังไม่เคยได้รับการรับรองมาก่อน ท่านทราบถึงมาตรฐานในอุตสาหกรรมกุ้งบ้างหรือไม่?
5C	ท่านทราบหรือไม่ว่ามีเกณฑ์ที่เกี่ยวข้องกับการแปรรูปกุ้ง?
5D	มีความยากหรือไม่ในการหาฟาร์มที่ได้รับการรับรองมาตรฐาน?
5E	มีความยากหรือไม่ ในการหาโรงงานผลิตอาหารกุ้งที่ได้รับการรับรองมาตรฐานแล้ว?
5F	ความยากลำบากหรือไม่ ในการหาฟาร์มเพาะเลี้ยงกุ้งที่ได้รับการรับรองมาตรฐานแล้ว?
5G	criteria ใดที่ท่านคิดว่าไม่สามารถดำเนินการปฏิบัติได้ที่โรงงานแปรรูปกุ้ง?
6	การสมัครเพื่อการรับรอง
6A	มีความต้องการใดบ้างจากลูกค้าสำหรับผลิตภัณฑ์กุ้งที่ได้รับการรับรอง?
6B	อะไรคือเหตุผลของบริษัทท่านที่เข้าร่วมการตรวจสอบรับรอง?
7	ผลที่ตามมาในอนาคตที่เกิดจากการสมัครเข้ารับการตรวจสอบรับรอง
7A	A_n มีผลกระทบใดบ้างในกระบวนการแปรรูปที่เกิดจากการสมัครเข้ารับการตรวจสอบรับรอง?
7B	การสมัครเข้ารับการตรวจสอบรับรองจะเพิ่มต้นทุนการผลิตหรือไม่?
7C	ผลิตภัณฑ์กุ้งที่ผ่านการรับรองจะมีราคาขายที่สูงขึ้นหรือไม่?
7D	ราคากุ้งของฟาร์มที่ผ่านระบบรับรองมาตรฐานแล้วสูงขึ้นหรือไม่?



In-depth interview: Buyer

- 1 ข้อมูลภูมิหลัง
- 1A ท่านซื้อกุ้งสดหรือผลิตภัณฑ์กุ้งแปรรูป?
- 1B ผู้ค้าหลักของท่านคือใคร?
- 2 สำหรับการซื้อ
- 2A ท่านซื้อกุ้งสดหรือผลิตภัณฑ์กุ้งการแปรรูปมาจากที่? ในกรณีการซื้อกุ้งจากบ่อ ท่านมีวิธีการ อย่างไรในการเลือกฟาร์ม
- 2B ท่านมีระเบียบในการเลือกเกษตรกรผู้เลี้ยงกุ้งเข้ามาทำสัญญาชื้อขายล่วงหน้าหรือไม่
- 2C มีขั้นตอนอย่างไร
- 2D ท่านมีประสบการณ์อย่างไรในการทำสัญญาชื้อขายล่วงหน้า, เลือกผู้ทำสัญญาร่วมที่ชื่อเสียง หรือไม่
- 2E ท่านมีการใช้ระบบมาตรฐานต่าง ๆจากที่ใดในการตัดสินใจชื้อกุ้ง? ถ้าใช้, ใช้อย่างไร
- 2F ท่านมีมาตรฐานเป็นของตัวเองในการซื้อกุ้งหรือไม่? ท่านใช้มาตรฐานอะไร? ท่านมีการ ตรวจสอบความสามารถของ suppliers อย่างไร
- 2G อะไรคือปัญหาหลักที่พบในการชื้อขายกับฟาร์มกุ้งที่สร้างใหม่
- 2H ในกรณีที่ชื้อกุ้งแปรรูปจากโรงงานแปรรูป, ท่านมีวิธีในการเลือกโรงงานแปรรูปอย่างไร
- 2I ท่านมีการทำสัญญาชื้อขายล่วงหน้ากับโรงงานแปรรูปหรือไม่
- 2J ท่านมีขั้นตอนอย่างไร
- 2K ท่านมีประสบการณ์ในการทำสัญญาซื้อขายล่วงหน้ากับโรงงานหรือไม่, เลือกโรงงานที่มี ชื่อเสียงหรือไม่
- 2L ท่านใช้มาตรฐานต่าง ๆจากที่ใดในการตัดสินใจเพื่อชื้อกุ้ง? ถ้าใช้, ใช้อย่างไร
- 2M ท่านมีมาตรฐานเป็นของตัวเองในการชื้อกุ้งจากโรงงานแปรรูปหรือไม่? ท่านใช้มาตรฐาน อะไร? ท่านมีการตรวจสอบความสามารถของ suppliers อย่างไร
- 2N อะไรเป็นปัญหาหลักที่พบเมื่อมีการติดต่อซื้อขายกับโรงงานแปรรูปใหม่
- 3 ท่านมีมุมมองอย่างไรเกี่ยวกับมาตรฐานกุ้ง
- 3A ท่านมีความคิดเห็นอย่างไรกับความพยายามในการตรวจสอบรับรองและติดฉลากบน ผลิตภัณฑ์กุ้ง?
- 3B มีการเริ่มต้นใดบ้างที่ท่านเชื่อว่าเป็นสัญญาและท่านให้ความสนใจในการซื้อกุ้งในอนาคต?
- 3C ท่านคิดว่าผลิตภัณฑ์กุ้งที่ผ่านการรับรองนั้นหาง่ายหรือไม่?
- 3D ท่านยอมจ่ายราคาที่สูงขึ้นหรือไม่สำหรับผลิตภัณฑ์กุ้งที่ผ่านการรับรอง?
- 3E ท่านเคยเข้าร่วมการประชุมที่เกี่ยวข้องกับมาตรฐาน/ฉลากรับรองผลิตภัณฑ์ใดมาบ้าง?



In-depth interview: Chamber of commerce

- 1 หอการค้า ดำเนินการอย่างไรเกี่ยวกับเรื่องต่อไปนี้
- ฟาร์มกุ้ง
- โรงเพาะฟัก
- โรงงานแปรรูป
- การตลาดกุ้ง
- การค้า : การส่งออกกุ้ง
- 2 ท่านมีความคิดเห็นอย่างไรเกี่ยวกับระบบรับรองกุ้ง (ACC, organic, GAP, CoC)?
- 3 ท่านคิดว่าอะไรคือ ประโยชน์ หรือ สิ่งดีดีที่เกิดจากระบบการรับรอง จากเรื่องต่อไปนี้ ?
- ด้านการตลาด / การค้า / ตราสินค้า / การแข่งขัน
- ท่านภาพ, ราคา , ปริมาณ
- สภาพ/สิ่งแวดล้อม : ประชาชน, ชีวิตความเป็นอยู่, สุขภาพ , น้ำ, ที่ดิน
- การปรับปรุง / การดูแลรักษา / แนวโน้มของกุ้ง
- 4 ท่านคิดว่าปัญหาอะไรบ้างที่เกิดจากระบบการรับรอง? และจะมีการแก้ไขปัญหาดังกล่าว อย่างไร?
- 5 ท่านคิดว่าผลกระทบจากระบบรับรองและฉลากของการผลิตกุ้งเป็นอย่างไร
- 6 ท่านมีความคิดเห็นอย่างไรต่อระบบรับรองกับกลยุทธ์การตลาดกุ้ง
- 7 ท่านคิดว่าประเทศไทยควรจะเข้าร่วมระบบการรับรองกุ้งหรือไม่
- 8 ระบบการรับรองจะก่อให้เกิดอุปสรรคต่อการค้ากุ้งหรือไม่
- 9 ระบบการรับรองจะเปิดโอกาสให้กับการค้ากุ้งหรือไม่
- 10 ระบบการรับรองใดที่ท่านคิดว่ามีความ<u>จำเป็น</u> / <u>สำคัญ</u> สำหรับประเทศไทย เพราะเหตุใด



In-depth interview: ACFS

- 1 ข้อมูลภูมิหลัง
- 1A คุณทำงานที่ไหน? ตำแหน่งอะไร?
- 1B คุณเข้าไปมีส่วนร่วมกับระบบรับรองมาตรฐานกุ้งหรือไม่?อย่างไร
- 2 คุณพบอะไรในมาตรฐานกุ้งที่แตกต่างกัน
- 2A คุณคิดอย่างไรในความพยายามที่จะติดฉลากมาตรฐานในผลิตภัณฑ์กุ้ง
- 2B คุณรู้เกี่ยวกับในระบบรับรองมาตรฐานอื่น ๆในกุ้งหรือไม่
- 2C คุณรู้อะไรเกี่ยวกับความแตกต่างของระบบรับรองมาตรฐานกุ้ง
- 2D คุณรู้ข้อมูลอะไรเกี่ยวกับการพัฒนาระบบมาตรฐานโดยกรมประมง
- 2E คุณรู้ข้อมูลเกี่ยวกับการพัฒนาระบบมาตรฐานขององค์กรต่างประเทศหรือในว่าระการประชุม หรือไม่
- 2F อะไรเป็นอุปสรรคในการที่ฟาร์มของไทยจะรับเอาระบบรับรองมาตรฐานของต่างประเทศมา ให้
- 2G อะไรเป็นโอกาสจากการที่ฟาร์มในประเทศไทยรับเอาระบบรับรองมาตรฐานของต่างประเทศ มาใช้
- 2H มีบทบาทอะไรในระบบรับรองมาตรฐานของกุ้ง
- 2I คุณคิดอย่างไรเมื่อมีการเปรียบเทียบมาตรฐานจากต่างชาติกับ GAP/CoC
- 2J ท่านเคยเข้าร่วมการประชุมเกี่ยวกับมาตรฐานใดมาก่อนหน้านี้หรือไม่? ท่านคิดอย่างไร เกี่ยวกับการประชุมนั้น ๆ?
- 2K คุณคาดการอย่างไรในอนาคตเมื่อมีการพัฒนาระบบรับรองมาตรฐาน
- 2L คุณเห็นอะไรในระบบรับรองมาตรฐานระหว่าง อาหารปลอดภัยและมาตรฐานสุขภาพกับ สังคมและสิ่งแวดล้อมที่ยั่งยืน



In-depth interview: ACC auditor

- 219 สถานที่ทำงานของคุณอยู่ที่ไหน?
- 219A สถานที่ตั้งมีความมั่นคงถาวรหรือไม่?
- 219B คุณมีตำแหน่งอะไร?
- 220 คุณเป็นผู้ตรวจรับรองของACCได้อย่างไร?
- 220A คุณพบเกี่ยวกับACCครั้งแรกเมื่อใด?
- 220B ใครที่สามารถเป็นผู้ตรวจรับรองของACCได้?
- 220C ในประเทศไทยตอนนี้มี ผู้ตรวจรับรองของACCทั้งสิ้นกี่คน? คุณคิดว่าในประเทศไทยมีคนที่ มีคุณสมบัติเพียงพอแก่การเป็นผู้ตรวจรับรองของACCทั้งหมดกี่คน?
- 221 คุณมีวิธีการอย่างไรในการตรวจฟาร์ม? มีความเกี่ยวข้องอะไรบ้าง?
- 221A ฟาร์มที่คุณเคยตรวจมีทั้งหมดกี่ฟาร์ม?
- 221B คุณมีการรายงานผลการตรวจฟาร์มอย่างไร?
- 221C ฟาร์มมีค่าใช้จ่ายในการตรวจฟาร์มเท่าไร? มีวิธีการจ่ายเงินอย่างไร?
- 221D ใครเป็นคนที่ตัดสินใจว่าฟาร์มได้รับการรับรองหรือไม่ได้?
- 222 จากประสบการณ์ของคุณ ในส่วนของเกณฑ์ข้อกำหนดมีส่วนใดง่ายและส่วนใดที่ยากสำหรับ การที่ฟาร์มจะรับไปปฏิบัติ
- 222A ในส่วนของเกณฑ์ข้อกำหนดฟาร์มส่วนมากสามารถรับไปปฏิบัติ? ทำไม?
- 222B ในส่วนของเกณฑ์ข้อกำหนดฟาร์มส่วนมากไม่สามารถรับไปปฏิบัติ? ทำไม
- 222C อะไรเป็นอุปสรรคสำหรับฟาร์มในเมืองไทยที่จะเข้าสู่มาตรฐาน ACC
- 222D มีโอกาสอะไรสำหรับฟาร์มในเมืองไทยที่ได้มาตรฐาน ACC
- 222E คุณเคยเข้าร่วมการประชุมเกี่ยวกับมาตรฐานต่าง ๆหรือไม่ แล้วคุณมีความรู้สึกอย่างไร เกี่ยวกับการประชุม?
- 223 ในทัศนคติของคุณ อะไรเป็นจุดแข็งและข้อจำกัดของข้อกำหนดในมาตรฐาน และ กระบวนการของACC
- 223A คุณคิดว่ามาตรฐาน ACC ง่ายต่อการส่งเสริมหรือไม่?
- 223B เมื่อเปรียบเทียบระหว่างมาตรฐานACC กับ GAPและCoC คุณมีความคิดอย่างไร?
- 223C นอกจากมาตรฐาน ACC แล้วยังมีมาตรฐานอื่นที่คุณรู้อีกหรือไม่?
- 223D คุณรู้อะไรเกี่ยวกับข้อกำหนดของระบบรับรองมาตรฐานกุ้งอื่น ๆ?



In-depth interview: Organic auditor

- 1 ข้อมูลภูมิหลัง
- 1A สถานที่ตั้งหน่วยงานท่านอยู่ที่ไหน?
- 2 การเริ่มต้นเป็น auditor
- 2A ท่านทำอย่างไรจึงได้กลายมาเป็นผู้ตรวจรับรองมาตรฐานอินทรีย์?
- 2B มีจำนวนผู้ตรวจรับรองในหน่วยงานท่านทั้งหมดเท่าไร?
- 3 การตรวจสอบ
- 3A มีจำนวนกี่ฟาร์มที่ท่านเคยให้การตรวจสอบรับรอง?
- 3B ท่านมีวิธีการในการตรวจสอบรับรองอย่างไร?
- 3C เกณฑ์ใดที่สำคัญที่สุดในการตรวจสอบ? ทำไม?
- 3D เกณฑ์ใดที่ไม่จำเป็นต้องทำการตรวจสอบมากที่สุด? ทำไม?
- 3E ท่านมีวิธีการในการรายงานผลการตรวจสอบรับรองฟาร์มอย่างไร?
- 3F ทางฟาร์มจะต้องจ่ายค่าดำเนินการการตรวจสอบรับรองเท่าไร?
- 3G ใครเป็นผู้ตัดสินใจที่จะให้การรับรองหรือไม่ให้การรับรองแก่ทางฟาร์ม?
- 4 ท่านมีมุมมองอย่างไรเกี่ยวกับหน่วยงานรับรองมาตรฐานอินทรีย์และมาตรฐานอื่น ๆ คือ อะไร?
- 4A มาตรฐานที่เกี่ยวกับกุ้งอินทรีย์ ท่านรู้จักกี่มาตรฐาน?
- 4B ท่านรู้ถึงความแตกต่างของมาตรฐานที่เกี่ยวกับกุ้งอินทรีย์หรือไม่?
- 4C ท่านคิดว่ามาตรฐานที่เกี่ยวกับกุ้งอินทรีย์นั้นง่ายต่อการนำมาปฏิบัติหรือไม่?
- 4D ท่านคิดว่าอะไรคือข้อจำกัดสำหรับฟาร์มกุ้งไทยต่อการเปลี่ยนไปเป็นกุ้งอินทรีย์?
- 4E ท่านคิดว่าอะไรคือโอกาสสำหรับฟาร์มกุ้งไทยต่อการเปลี่ยนไปเป็นกุ้งอินทรีย์?
- 4F ท่านคิดอย่างไรเกี่ยวกับมาตรฐานอินทรีย์เมื่อเปรียบเทียบระหว่างมาตรฐาน GAP/CoC or มาตรฐานเกษตรอินทรีย์ของไทย (ACT) ? ท่านเคยเข้าร่วมการประชุมเกี่ยวกับมาตรฐานใด มาก่อนหน้านี้หรือไม่? ท่านคิดอย่างไรเกี่ยวกับการประชุมนั้น ๆ?



In-depth interview: DoF

- 1 ข้อมูลภูมิหลัง
- 1A ท่านทำงานที่ไหน? ตำแหน่งอะไร?
- 1B งานของท่านมีความเกี่ยวข้องกับมาตรฐานการรับรองหรือไม่? อย่างไร?
- 2 การพัฒนาของมาตรฐาน GAP/CoC
- 2A ท่านมีความคิดเห็นอย่างไรเกี่ยวกับความพยายามในการทำระบบรับรองและจัดทำฉลากบน ผลิตภัณฑ์กุ้ง?
- 2B ท่านมีความเกี่ยวข้องกับการพัฒนา GAP/CoC หรือไม่? อย่างไร?
- 2C ท่านช่วยอธิบายเกี่ยวกับการดำเนินการพัฒนา GAP/CoC ?
- 2D ท่านช่วยอธิบายเกี่ยวกับ GAP/CoC ฉบับปรับปรุงใหม่?
- 2E ท่านมีความคิดเห็นอย่างไรเกี่ยวกับวัตถุประสงค์ หลักการ เกณฑ์และตัวชี้วัด ?
- 3 การดำเนินการของมาตรฐาน GAP/CoC
- 3A ท่านคิดว่าเอกสารของมาตรฐาน GAP/CoC นั้นง่ายต่อการทำความเข้าใจของผู้เลี้ยงกุ้ง หรือไม่?
- 3B ท่านมีประสบการณ์ทำงานเกี่ยวกับการส่งเสริมมาตรฐาน GAP/CoCให้ กับฟาร์มเพาะเลี้ยง หรือฟาร์มลี้ยงกุ้งหรือไม่?
- 3C ท่านคิดว่ามีเกณฑ์ ใดบ้างที่ทำให้โรงเพาะฟักไม่สามารถปฏิบัติได้? ทำไม?
- 3D ท่านคิดว่ามีเกณฑ์ใดบ้างที่ทำให้ฟาร์มเลี้ยงกุ้งไม่สามารถปฏิบัติได้? ทำไม?
- 3E ท่านคิดว่ามีเกณฑ์ใดบ้างที่ยาก(เป็นไปไม่ได้)ในการปฏิบัติ? ทำไม?
- 3F ท่านคิดว่ามีเกณฑ์ ใดบ้างที่เหมาะสมกับทุกฟาร์มเลี้ยงกุ้ง โดยเฉพาะอย่างยิ่งกับฟาร์มขนาด เล็ก?
- 3G ท่านคิดว่าผู้เลี้ยงกุ้งต้องการได้รับความช่วยเหลือเกี่ยวกับการทำความเข้าใจมาตรฐาน GAP/CoC หรือไม่ ?
- 3H กรมประมงมีการให้ความช่วยเหลือแก่ผู้เลี้ยงกุ้งหรือไม่?
- 3I มีการให้ความช่วยเหลือด้านการเงินเพื่อให้เข้าร่วมการรับรองมาตรฐาน GAP/CoC ?
- 4 การตรวจสอบของมาตรฐาน GAP/CoC
- 4A ใครคือผู้ตรวจสอบ? มีจำนวนผู้ตรวจสอบทั้งหมดเท่าไร?
- 4B ท่านมีความเกี่ยวข้องในการตรวจสอบฟาร์มเลี้ยงกุ้งตามมาตรฐาน GAP/CoC หรือไม่?
- 4C ท่านดำเนินการตรวจสอบฟาร์มอย่างไร?
- 4D มีจำนวนฟาร์มที่ท่านเคยดำเนินการตรวจสอบมาแล้วกี่ฟาร์ม?

"Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry"



- 4E เกณฑ์ใดบ้างที่มีความสำคัญที่สุดที่ทางฟาร์มควรดำเนินการ? ทำไม?
- 4F เกณฑ์ใดบ้างที่ไม่มีความสำคัญเลย ที่ทางฟาร์มต้องดำเนินการ? ทำไม?
- 4G ฟาร์มจะต้องดำเนินการอย่างไรเพื่อให้ได้การรับรองภายหลังจากมีการตรวจสอบแล้ว?
- 4H ท่านเคยได้รับความคิดเห็นใดบ้างจากฟาร์มที่ทำการตรวจสอบซ้ำ?
- 5 มีมุมมองอย่างไรกับมาตรฐานการรับรองกุ้งของต่างประเทศ (ACC, Organic, GLOBALG.A.P.)?
- 5A ท่านรู้จักมาตรฐานการรับรองของต่างประเทศ มาตรฐานใดบ้าง?
- 5B ท่านทราบข้อมูลใดบ้างของมาตรฐานการรับรองของต่างประเทศ?
- 5C ท่านคิดว่ามาตรฐานการรับรองของต่างประเทศง่ายต่อการดำเนินการหรือไม่?
- 5D ท่านคิดว่าอะไรคืออุปสรรคสำหรับฟาร์มในประเทศไทยในการปรับตัวสู่ระบบรับรอง มาตรฐานของต่างประเทศ?
- 5E ท่านมีความคิดเห็นอย่างไรเมื่อเปรียบเทียบระหว่างมาตรฐาน ของต่างประเทศกับมาตรฐาน GAP/CoC?
- 5F ท่านเคยเข้าร่วมการประชุมมาตรฐานใดมาบ้าง? ท่านความรู้สึกอย่างไรเกี่ยวกับมาตรฐาน นั้น?



In-depth interview: Local expert

- 1 ข้อมูลภูมิหลัง
- 1A ท่านทำงานในอุตสาหกรรมกุ้งมาเป็นเวลากี่ปี?
- 1B ความชำนาญหลักของท่านคืออะไร?
- 2 บทบาทของท่านต่อการรับรองมาตรฐานกุ้ง
- 2A ท่านเกี่ยวข้องในการพัฒนาหลักเกณฑ์และมาตรการของการรับรองมาตรฐานหรือไม่?
- 2B หน่วยงานราชการใดที่ท่านติดต่อด้วย? อย่างไร? ท่านทำอะไรร่วมกัน?
- 2C บริษัทหรือหน่วยงานเอกชน? อย่างไร ? ท่านทำอะไรร่วมกัน?
- 2D ท่านทำอะไร? ท่านรับผิดชอบเรื่องใด? อิทธิพลอะไรที่ท่านมี?
- 3 เกี่ยวกับแบบแผนการรับรองมาตรฐานกุ้งที่แตกต่างกัน
- 3A แบบแผนการรับรองมาตรฐานกุ้งที่ท่านคุ้นเคยคืออะไร?
- 3B อะไรคือลักษณะเฉพาะที่สำคัญของแบบแผนนี้?
- 3C อะไรคือความเหมือนที่สำคัญ? อะไรคือความแตกต่างที่สำคัญที่สุด?
- 3D ท่านคิดอย่างไรเกี่ยวกับการรับรองมาตรฐานของต่างประเทศ เปรียบเทียบระหว่าง GAP/CoC?
- 3E ท่านเห็นด้วยกับหลักเกณฑ์ และมาตรการ/ดัชนีชี้วัดนี้ หรือไม่?
- 3F แบบแผนใดที่ท่านคิดว่าได้รับการออกแบบและดำเนินการได้สำเร็จได้ดีเป็นพิเศษ? อะไรเป็น เหตุผลสำหรับการปฏิบัติที่ดี?
- 3G แบบแผนใดที่แย่มาก? เพราะเหตุใด?
- 3H ท่านเคยให้ความช่วยเหลือด้านเทคนิคกับการเพาะฟัก ฟาร์ม ผู้ดำเนินการ เพื่อการ ดำเนินการรับรองมาตรฐานหรือไม่?
- 3I แบบแผนการรับรองมาตรฐานใดที่ประสบความสำเร็จยากที่สุดในความคิดเห็นของท่าน?
- 3J แบบแผนการรับรองมาตรฐานใดที่ประสบความสำเร็จง่ายที่สุดในความคิดเห็นของท่าน?
- 3K มาตรการหรือมาตรฐานใดที่ต้องการการปรับเปลี่ยนมากที่สุดในการดำเนินการ?
- 3L ในระดับดำเนินการท่านพบผลกระทบของการดำเนินการขอรับรองมาตรฐานอย่างไร? (การ เพาะฟัก ฟาร์ม และ ผู้ดำเนินการ)?
- 3M ในระดับหน่วยงานท่านพบผลกระทบของการดำเนินการขอรับรองมาตรฐานอย่างไร? (กรม ประมง, ACFS, etc.)?
- 4 ท่านคาดหวังแบบแผนการรับรองมาตรฐานที่เกี่ยวข้องกับอุตสาหกรรมการเลี้ยงกุ้งในอนาคต อีก 10 ปีข้างหน้าอย่างไร?
- 4A ความแตกต่างอะไรในกระบวนการที่ท่านต้องการจะเห็น? ความแตกต่างอะไรในเกณท์ มาตรฐาน หรือ องค์ประกอบอื่นๆ ของแบบแผนที่ท่านต้องการจะเห็น?



In-depth interview: Foreign expert s

- 1 มีระบบรับรองใดที่ท่านคุ้นเคย
- 1A ลักษณะเด่นของระบบรับรองมาตรฐานคืออะไร
- 1B ส่วนใดในมาตรฐานหรือข้อปฏิบัติที่เข้าใจได้ง่าย
- 1C ส่วนใดในที่ข้อปฏิบัติหรือมาตรฐานต้องการทำให้ต้องมีการเปลี่ยนแปลงการจัดการมากที่สุด
- 1D ส่วนหลักใดที่คล้าย? ข้อแตกต่างใดที่สำคัญ?
- 1E ท่านเคยได้ยินเกี่ยวกับ GAP และ COC ของไทยหรือไม่
- 1F ท่านคิดอย่างไรกับGAP และ COC ของไทยเมื่อเปรียบเทียบกับมาตรฐานของต่างประเทศ
- 2 ท่านมีบทบาทอย่างไรในการพัฒนาหรือใช้ประโยชนในรายละเอียดของมาตรฐาน
- 2A ท่านทำอะไร? รับผิชอบในส่วนใด? ท่านมีอำนาจอะไร?
- 2B ท่านคิดเกี่ยวกับแบบแผนได้อย่างไร
- 3 ท่านคิดอะไรเกี่ยวกับข้อกำหนดที่เป็นข้อบังคับหลักหรือเฉพาะเจาะจงในข้อปฏิบัติของ มาตรฐานนอกเหนือจากที่ท่านกล่าวถึง
- 3A ในส่วนของการจัดการของเกษตรกร
- 3B ในส่วนของภาคธุรกิจกับเกษตรกร, ผู้ชื้อและผู้ที่มีส่วนเกี่ยวข้องอื่น ๆในห่วงโช่ภาคการเกษตร
- 3C What do you think have been the more combined or non-specific influences?
- 4 องค์กรใดที่ท่านทำการติดต่อเกี่ยวกับเรื่องระบบรับรองมาตรฐาน
- 4A ท่านติดต่อกับใครในหน่วยงานราชการ
- 4B มีผู้ที่ไม่เป็นคนในหน่วยงานราชการด้วยหรือไม่? อย่างไร?อะไรที่ทำให้ท่านรวมคนเหล่านั้น เข้าร่วมด้วย
- 5 อะไรเป็นตัวอย่างของข้อกำหนดในมาตรฐานที่ดีที่สุด, ดี , ไม่ดี
- 5A ท่านคิดว่ารูปแบบและรายละเอียดของมาตรฐานในส่วนใดที่มีข้อดี? เหตุผลใดที่เป็นข้อดีใน การปฏิบัติ
- 5B แล้วส่วนใดที่ไม่ดี? เพราะคะไร?
- 6 ท่านมีประสบการณ์เกี่ยวอะไรตอนที่ท่านทำงานกับโรงงานผลิตกุ้ง
- 6A ท่านเข้ามามีส่วนเกี่ยวข้องกับโรงงานครั้งแรกเมื่อใด
- 6B ตั้งแต่ตอนนั้นมาท่านทำอะไร
- ท่านคิดว่าข้อกำหนดของมาตรฐานที่ใช้กับโรงงานอุตสาหกรรมกุ้งจะเปลี่ยนแปลงไปใน ทิศทางใดในอีก 10 ปีข้างหน้า
- 7A ข้อแตกต่างอะไรในกระบวนการผลิตที่ท่านอยากเห็น
- 7B ข้อแตกต่างในกฎ, มาตรฐาน หรือ ข้อกำหนดต่าง ๆ ใดในมาตรฐานที่ท่านอยากเห็น



In-depth interview: TAO

- 1. ปัจจุบันท่านดำรงตำแหน่งและมีหน้าที่ความรับผิดชอบอะไรบ้างใน อบต.
- 1A ท่านรู้เรื่องต่าง ๆเกี่ยวกับฟาร์มกุ้งหรือไม่, แล้วรู้อะไรบ้าง
- 2. อบต.มีส่วนเกี่ยวข้องกับฟาร์มกุ้งอย่างไร
- 2A ที่ตั้งฟาร์มของท่านได้รับอนุญาตในการทำฟาร์มกุ้งหรือไม่ มีเจ้าหน้าที่ออกเอกสารสิทธิ์หรือ โฉนดใหท่านหรือไม่
- 2B หน่วยงาน อบต. ได้ออกกฎข้อบังคับเพื่อใช้สำหรับฟาร์มกุ้งในท้องถิ่นหรือไม่
- 2C ท่านได้รับค่าใช้จ่ายเพื่อสิ่งก่อสร้างต่าง ๆ ที่เกี่ยวข้องกับฟาร์มกุ้งหรือไม่, การวางแผนหรือการ ฝึกสอน
- 2D ท่านเคยถูกเรียกเพื่อเข้าร่วมแก้ปัญหาต่าง ๆ หรือไม่
- 3. การเติบโตของฟาร์มกุ้งส่งผลกระทบอย่างไรกับผู้คนที่อาศัยอยู่ในพื้นที่
- 3A ผลดีและผลเสียของการที่มีฟาร์มกุ้งเกิดขึ้นในชุมชน ,อย่างไร กรุณายกตัวอย่าง
- 3B ท่านหรือครอบครัวของท่านเคยมีฟาร์มกุ้งหรือไม่
- 4. การทำฟาร์มกุ้งส่งผลกระทบต่อสิ่งแวดล้อมในบริเวณท้องถิ่นของท่านอย่างไรบ้าง
- 4A อย่างไร, อธิบายและยกตัวอย่าง
- 4B ผลกระทบเหล่านี้ส่งผลต่อผู้ที่อยู่อาศัยบริเวณนี้หรือไม่ อย่างไร
- 5. ในปีที่ผ่านมาโดยความสัมพันธ์ระหว่างฟาร์มกับชุมชนในท้องถิ่น ทางฟาร์มนั้นมีการ เปลี่ยนแปลงไปในทางที่ทำให้เกิดความสำคัญแก่ชุมชนท้องถิ่น หรือไม่อย่างไร
- 6. ท่านเคยได้รับข้อมูลเกี่ยวกับระบบรับรองมาตรฐานฟาร์มหรือไม่
- 6A มีความสำคัญอย่างไรสำหรับท่าน
- 6B ท่านเคยได้รับการชักชวนเข้าเป็นสมาชิกของ อบต.หรือไม่
- 6C ในระบบการรับรองฟาร์มกุ้ง มีการคำนึงถึงผลกระทบของด้านสิ่งแวดล้อมและผลกระทบทาง สังคมต่อชุมชนในท้องถิ่น , ท่านมีความคิดเห็นอย่างไร และมีอะไรที่ท่านต้องการให้เพิ่มเติม
- 7. ท่านคิดว่า อบต.มีบทบาทอะไรต่อความสัมพันธ์กับฟาร์มกุ้ง
- 7A มีบทบาทแตกต่างอย่างไรกับในปัจจุบัน
- 7B ควรต้องทำอะไรบ้าง ถ้าหากจะเปลี่ยนหน้าที่เหล่านี้
- 8. ท่านคิดว่าอีก 10 ปีข้างหน้า ฟาร์มกุ้งในบริเวณท้องถิ่นท่านจะเป็นอย่างไร
- 9. ข้อเสนอแนะจาก อบต. เกี่ยวกับฟาร์มกุ้ง



In-depth interview: Affected community

- 1. ครอบครัวของท่านประกอบอาชีพอะไร
- 1A. ในอดีตท่านและครอบครัวของท่านประกอบอาชีพอะไร
- 2. ช่วยเล่าประวัติความเป็นมาของฟาร์มกุ้งในบริเวณนี้ว่าเกิดขึ้นได้อย่างไร
- 2A. เกิดขึ้นเมื่อไหร่และตรงไหนเป็นที่แรกของสถานที่ที่ตั้งฟาร์ม
- 2B. ท่านเคยมีฟาร์มกุ้งเป็นของตนเองไหม
- 2C. ท่านเคยทำงานที่ฟาร์มกุ้งไหม
- 3. ในการทำฟาร์มกุ้งส่งผลกระทบต่อการดำเนินชีวิตของท่านหรือไม่
- 3A. กรุณาอธิบาย และยกตัวอย่าง
- 3B. ส่งผลกระทบอะไรต่อครอบครัว ญาติ หรือบุคคลอื่น ๆ ในชุมชนที่ท่านอาศัยอยู่
- 3C. ถ้าส่งผลกระทบ ท่านร้องเรียนกับใคร และท่านแก้ไขอย่างไร
- 4. การทำฟาร์มกุ้งส่งผลดีอย่างไรต่อชุมชนของท่าน
- 4A. มีผลดีอย่างไร ตัวอย่างเช่น ผลดีต่ออาชีพ หรือสิ่งก่อสร้างใหม่
- 4B. ผลเสียมีอะไรบ้าง อย่างเช่น มีการทะเลาะเรื่องแย่งที่ดินและน้ำซึ่งเกี่ยวข้องกับฟาร์มกุ้งหรือไม่
- 5. ในปีที่ผ่านมา ฟาร์มเลี้ยงกุ้งมีบทบาทสำคัญต่อท้องถิ่นของท่านเพิ่มขึ้นหรือไม่
- 5A . กรุณายกตัวอย่าง
- 6. ท่านรู้กฎหรือข้อบังคับเกี่ยวกับฟาร์มกุ้งในพื้นที่นี้หรือไม่
- 6A. มีการใช้อย่างไร, โปรดอธิบาย
- 6B ใครเป็นผู้ออกกฎข้อบังคับ และเพื่อเหตุผลใด
- 7. ท่านเคยได้ยินเกี่ยวกับระบบรับรองฟาร์มกุ้งหรือไม่
- 7A. มีความหมายอย่างไรสำหรับตัวท่าน
- 7B. ท่านคิดว่าฟาร์มกุ้งบริเวณนี้ คำนึงถึงความสำคัญของสิ่งแวดล้อมและสังคมหรือไม่ อย่างไร ในระบบการรับรองฟาร์มกุ้ง มีการคำนึงถึงผลกระทบของด้านสิ่งแวดล้อมและผลกระทบทาง สังคมต่อชุมชนในท้องถิ่น , ท่านมีความคิดเห็นอย่างไร และมีอะไรที่ท่านต้องการให้เพิ่มเติม
- 8. ฟาร์มกุ้งในบริเวณนี้ส่งผลกระทบต่อสิ่งแวดล้อมหรือไม่
- 8A. อย่างไร,โปรดอธิบาย
- 8B. การเปลี่ยนแปลงและผลกระทบเหล่านี้ส่งผลต่อผู้ที่อาศัยบริเวณนี้หรือไม่ อย่างไร



In-depth interview: Worker

- 1. ภูมิหลัง
- 1C ท่านเคยประกอบอาชีพเกี่ยวกับการเลี้ยงกุ้งมาเป็นระยะเวลาเท่าไร? ท่านมีสัญชาติใด?
- 1D ก่อนหน้านี้ท่านประกอบอาชีพอะไรมาก่อน?
- 2. ความรู้เกี่ยวกับระบบรับรองมาตรฐานกุ้ง
- 2A ท่านทราบหรือไม่ว่าฟาร์มของท่านได้การรับรองมาตรฐานอะไรบ้าง? ทราบได้อย่างไร?
- 2B เจ้าของฟาร์มของท่านเคยมีการอธิบายเกี่ยวกับระบบรับรองมาตรฐานให้ท่านทราบบ้าง หรือไม่?
- 2C ท่านทราบเกี่ยวกับข้อกำหนดด้านแรงงานในมาตรฐานต่าง ๆบ้างหรือไม่?
- ความเป็นอยู่ในฟาร์ม?
- 3A ท่านมีสัญญาว่าจ้างในการทำงานหรือไม่?
- 3B ในมุมมองของท่านที่พักอาศัยของท่านในฟาร์มแห่งนี้เป็นอย่างไร?
- 3C ท่านคิดว่าสวัสดิการที่ท่านได้รับระหว่างการทำงานเป็นอย่างไร?
- 3D ท่านคิดว่ากฎข้อห้ามของทางฟาร์มข้อใดที่ท่านคิดว่าไม่ควรมี?
- 3E ท่านได้รับการฝึกอบรมในการใช้สารเคมีและการใช้ยาบ้างหรือไม่?
- 3F ท่านคิดว่าระบบป้องกันอุบัติเหตุที่เกิดขึ้นในฟาร์มอยู่ในระดับใด?
- 4. ผลที่ได้รับจากการสมัครเข้าร่วมการรับรองมาตรฐาน
- 4A ท่านคิดว่าเมื่อฟาร์มที่ท่านปฏิบัติงานได้การรับรองมาตรฐานแล้วความเป็นอยู่ของท่านมีสิ่งใด เปลี่ยนแปลงไปบ้าง?
- 4B ท่านคิดว่าระบบการรับรองมาตรฐานมีส่วนช่วยให้การทำงานของท่านมีความปลอดภัยขึ้น หรือไม่?
- 4C ท่านคิดว่าระบบการรับรองมาตรฐานมีประโยชน์ต่อตัวท่านอย่างไร?