STRATEGIC PLAN 2020-2025

Australian Abalone Growers Association
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Contents

Foreword

Aquaculture is the world's fastest growing primary industry.

Abalone farming in Australia has established its reputation as a viable producer of farmed abalone of exceptional and consistent quality.

Premium quality is central to our industry. Market demand for our product is strong with farm gate prices reflecting the premium quality of our products in international markets, being ranked 1st or 2nd on a per kg basis.

We plan to grow our industry in volume and value through increased focus on sustainable farming of high-quality abalone for niche customers. Our farms expect to double sector production over the next 5 year planning horizon to 2025. Note that this document was drafted during the coronavirus pandemic and related market uncertainty.

Consolidation of our industry over the last five years has resulted in improved economies of scale on farms, and an increasing adoption of technologies and practices that are boosting production efficiency and product quality. Furthermore, this growth will ensure that our industry continues to stimulate local rural communities and economies whilst providing more and better-quality employment opportunities.

To achieve this growth, we need to attract further investment, better understand our key threats, overcome some regulatory barriers, and invest further in research and development to ensure improvements to production efficiency and the continued safety, quality and integrity of the abalone we produce.

AAGA will continue its central roles to convene strategic thinking, advocate on behalf of our industry to government and the broader community, and coordinate our research and development activities.

This Plan summarises our strategic goals, aspirations and plans at May 2020 and the outcomes we aim to achieve by June 2025. The Plan is designed to provide guidance whilst allowing agility for the AAGA board and its Members to assess and prioritise future themes and projects, and related investments. The design also enables reporting of progress against the Plan, to Members and external stakeholders. It became apparent during the drafting of this plan that additional funding will be required to meet the breadth of R&D objectives described herein.

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Acknowledgements

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- Fisheries Research and Development Corporation (FRDC) for funding,
- Australian Abalone Growers Association Members for input,
- Ridge Partners for contribution to the development of the Plan.

1. STRATEGY FRAMEWORK

Vision and Mission

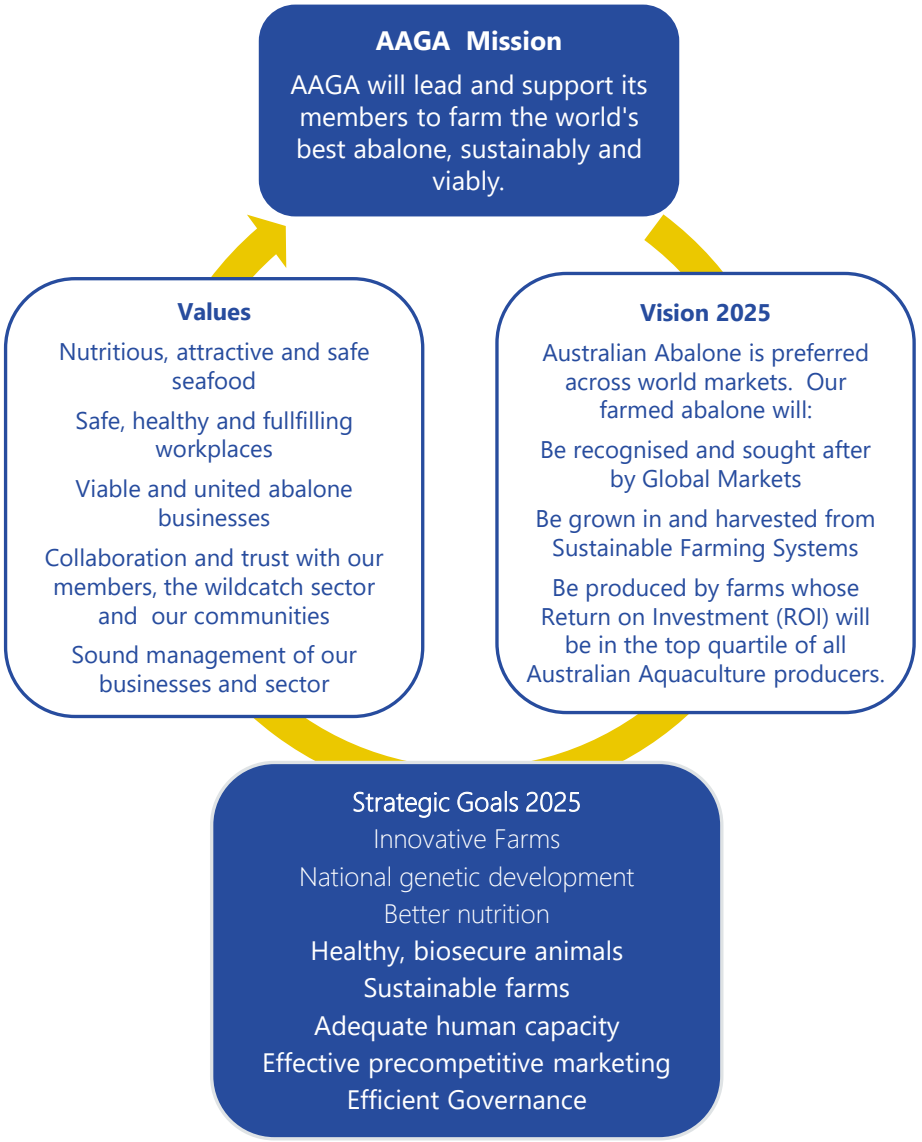
Australia's abalone farmers produce high quality products for local and global markets. Collectively these farmers contribute (subject to coronavirus impacts) about 1,100 tonnes to a global abalone supply of ~139,000 tonnes (wild catch 6,400 and aquaculture 132,000 tonnes; FAO 2017).

As a niche supplier Australian farms face significant challenges and opportunities over the coming decade to 2030. But by working and investing together the farms intend to build on their initial 2015-20 Plan, to consolidate and improve their position for 2020-25 and over the long term.

Members of AAGA represent >95% of Australian farmed abalone production. In early 2020 the association engaged all farmers, investors and key stakeholders to review their sector performance over the past five years, and to guide this Plan based on enterprise and sector aspirations, trends and strategic options to 2025. The coronavirus pandemic was underway during the Plan's development.

Members considered the key strategic issues, risks and goals for farmed products in global and domestic markets, the priorities for creating and preserving value along the chain from hatchery to market, and the expectations of investors and the community regarding the performance of businesses in the aquatic environment. Members identified their organisational Vision, Mission and Values for the coming decade.

This Plan draws these strategic themes, priorities and actions together in a document that AAGA will implement on Members' behalf. The Plan also provides Members with a united platform to leverage their RD&E investment via a new Industry Partnership Agreement (IPA) with the FRDC.



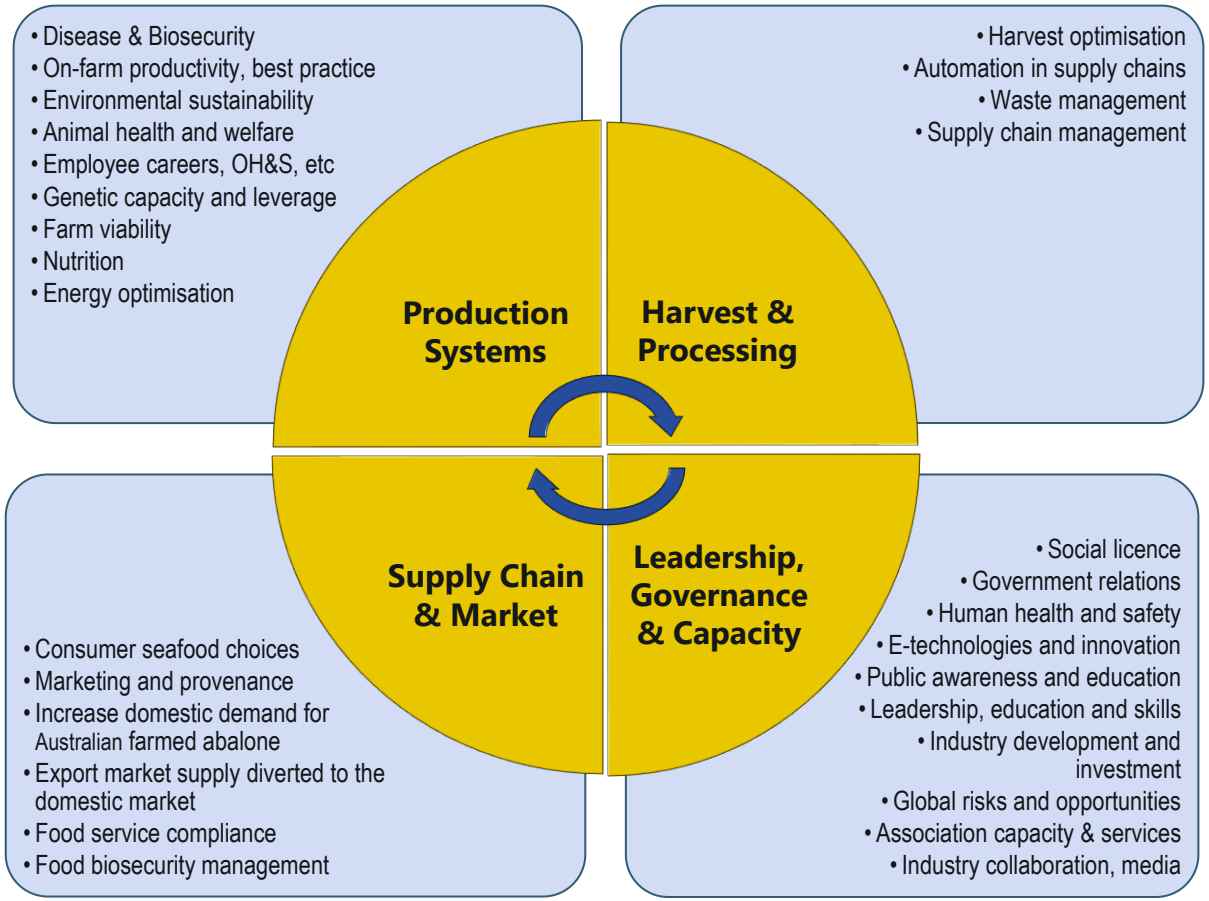
Drivers and Risks

Global Trends and Risks

- Good quality farmed products from South Korea and South African are significant competitors for Australian farms
- Some farm capacity in China is not viable – but China will remain the dominant market and producer
- Productivity driven by innovation – technologies, breeding, supply chains
- Markets seek rewarding sustainable farm systems
- Increased risk of uncontrolled global human and animal disease – e.g. swine fever, coronavirus
- Climate change will be a risk to all farms driven by storm damage, increased water temperature and greater disease risks.

Australian Trends and Risks

- AAGA growth aspirations from 2015 were moderated by investor consolidation, red tape on farms, environmental compliance, fire, and disease events
- Australian wildcatch volume still declining
- Uncertainty / decline in the Australian wildcatch abalone fishery may impact AAGA
- Increased downward price pressure due to global oversupply
- Australian farms can only farm local species (Greenlip and hybrids) – due to strict biosecurity. China has (genetically enhanced) traditional and imported spp.
- Reduced demand (domestic and export) due to impacts from COVID-19.



Australian Farmed Abalone Industry - SWOT & Competitive Advantage

STRENGTHS

Australia's leadership position in global abalone markets

Australia's good reputation in global markets - desirable species; clean water farming; reputation for safe, sustainable and attractive seafood

Farmed abalone industry restructure has increased farm management capacity while spreading geographic site risks

Corporate capacity: two largest farm groups comprise ~80% of production

Limited scale as a niche supplier to premium global markets

95% of farm production is from AAGA Members

WEAKNESSES

Lack of economic scale in global abalone farming increases unit costs

Limited use of modern aquafarm technologies

Labour: very high labour costs and poor quality jobs

High energy costs relative to production

No/limited genetic breeding program or crossborder movement protocols

Low potential to mitigate climate change impacts

No common grading specs used or reported across industry

Low level of collation/reporting of key data - labour, product specs, OHS etc

Uncontrolled exposure to farm risks such as stock loss or fire

Out-of-date AAGA Constitution relative to emergings needs

Member service needs are increasingly beyond capacity of AAGA executive office

Competitive Advantage

1. Sustainable farms:- social licence to farm, animal welfare, clean water. 2. Unique seafood:- uniform size, colour and texture; plump well fed fish; jade green shell. 3. Premium Offer:- safe food, live format, free of debris

Work with feed companies: new proteins, more transparent feed outcomes

Proactively explore seeding services to wildcatch industry

Broaden funding base for RD&E

Gather data to describe our social license to operate

Reduce farm insurance expenses through joint farm policy - fire and stock

Consider AquaPlan, SIA, NAC, Blue Economy CRC, Revise AHAP to be more encompassing

Solve the summer mortality problem

Embrace technology: water quality, data capture, mechanisation, feeding, cleaning, harvesting, grading

Per Kg of Production: Lower CO_2 output AND lower labour costs

Establish a Trade Mark to differentiate Australia's quality niche brand

Define key national animal health measures and metrics for diseases

Identify, monitor, and manage key farm capacity issues: FTEs, OH&S, SOPS, training

Manage RD&E investment more effectively via a new industry committee

Add input suppliers to an "Affiliated Member" category in Constitution

OPPORTUNITIES

Lack of engagement in selected precompetitive marketing initiatives - scope out a project and investment concept with leading farm groups

Engage wildcatch, chefs and others in collaborative marketing initiatives

Lack of sector market profile due to small production volume

Poor understanding of summer mortality (and cost-effective solutions)

Poor understanding of alternate proteins (vegetarian, non-vegetarian feeds, etc)

Poor understanding of impacts of choice re sites, species, age, temperature,

Poor understanding of abalone microbiome and gut health

Waste of industry R&D investment due to duplication and poor outcome capture

High farm employee turnover due to low satisfaction and poor career planning

Rising expectations of community and regulators regarding social license to operate

Uncertain market impacts as a result of the coronavirus pandemic

THREATS

Strategic Goals 2025

1. Farm Innovation
- Establish and implement technologies and procedures to boost farm efficiency
- Identify, support adoption of productivity gains via automation
- Establish new protocols, technology to improve stock movement
- Monitor, report key data- labour costs, product biomass and productivity specs, OHS etc

2. Genetics
- Establish a national AAGA Genetics Program with regulators across all sites to enable and enhance biosecure genetic development
- Improve nutrition, growth, survival and product quality
- Understand summer mortality: develop cost-effective solutions

3. Nutrition
- Understand summer mortality: develop cost-effective solutions
- Identify alternate proteins - seaweed, sites, species, age, temperature, etc
- Understand feed specifications and impacts - improve farmer choices
- Understand abalone microbiome and gut health

4. Animal Health & Biosecurity
- Define key national animal health measures and metrics, including for existing and emerging diseases, and benchmarking
- Establish a national AAGA Abalone Health Surveillance Program
- Understand summer mortality: develop cost-effective solutions
- Better understand the link between animal health and farm management

5. Sustainable Farming
- Investigate, enhance the interaction of stocking density - growth - yield
- Investigate, benchmark energy efficiency options and greenhouse gases
- Investigate climate change science - optimise mitigation and adaptation

6. Human Capacity
- Establish, benchmark basic farm capacity/tools: OH&S, SOPS, training, etc
- Establish AAGA program to monitor, document and retain farm staff and improve their career and job satisfaction

7. Market Development
- Engage in selected precompetitive marketing initiatives - scope project and investment concept with leading farm groups - Trademark or brand Australian farmed abalone
- Engage wildcatch, chefs and others in collaborative marketing initiatives
- Establish, implement common sector grading specs down chain, and reports

8. Governance
- Review, upgrade AAGA Constitution to meet current and emerging needs
- Review farm and member service needs, and EO capacity and resourcing
- Establish an RD&E Subcommittee to guide AAGA/FRDC IPA investments
- Acquire additional sources of funding to support RD&E Investment

Outcomes 2025

1. Tech and procedures to drive farm efficiency
2. Modern farm systems - technology, ICT, AI
3. Efficient harvesting and stock movement

1. National AAGA Genetics Program
2. Enhanced performance through genetic leverage and improvement
3. Control of summer mortality

1. Control of summer mortality
2. Alternate feed proteins
3. Better feed specifications and choices
4. Better microbiome / gut health

1. National Abalone health status metrics
2. National Ab. health surveillance program
3. Identify/report summer mortality triggers
4. Integrated health & management practices

1. Sustainable Stock density+Growth+Yield
2. Efficient energy use and reduced GHGs
3. Climate change mitigation and adaptation
4. Possible onfarm energy generation/benefits

1. Farm capacity benchmarks - OHS, etc
2. Farmer and employee career planning
3. Better staff retention and job satisfaction

1. Chef engagement and tours to farms
2. Precompetitive joint generic marketing
3. Participation in selected trade shows
4. Investment in social media platforms
5. Consistent product grading specs & data

1. AAGA Constitution that meets needs
2. Better RD&E funding and management
3. Adequate AAGA and service capacity

2. INDUSTRY CONTEXT

Production and Markets

Abalone is a traditional cuisine in Asian cultures, including for China, Japan and Korea. Most (>90%) of Australian abalone production (wild and farmed) is exported to Japan, Hong Kong, China, Singapore, Taiwan, USA, Canada, and the EU. Ongoing immigration and tourism by Asian citizens are also increasing domestic demand for abalone.

China is the biggest producer of and market for abalone. China's switch from rural to urban life is creating a new consumer middleclass. In 2020 the nation has ~60 million affluent consumers (6% of population) each earning at least US$34,000 p.a., in 21 million households across key cities. Putting aside the impacts of austerity campaigns, coronavirus and other threats, their discretionary "dining out" spend is expected to grow by 10.2% p.a. through to 2022. But many young consumers are less attracted to traditional abalone cuisine - new social media marketing platforms offer ways to engage them.

Australia contributes ~3.0% to global abalone supply, from wildcatch fisheries and farms. Farms operating from 12 sites across four southern states produced around 1,120 tonnes in 2019.

Australian abalone fisheries and farms have established a premium reputation for high quality, safe abalone products, increasingly in live or chilled formats. Declining trade tariffs in China have also supported Australian abalone farm growth.

Australian farms supply multiple formats: 45% frozen in shell, 35% cooked and canned, 15% live, and 5% frozen meat or in consumer pouches. Around 25% of farm supply is sold domestically (40% live, 50% frozen, 9% canned and 1% in consumer pouches). A focus on producing larger size abalone for niche markets is attractive to Australian farmers.

China comprises ~81% of world abalone supply. But coastal farm degradation in coastal environments, coronavirus pandemic restraints, and reduced demand from younger consumers suggest that China's supply will decline 25% by 2025.

Production	2012	2013	2014	2015	2016	2017	2018	2019	2020
Wildcatch '000 t.							Est.	Est.	Est.
Australia	4.5	4.3	3.9	3.8	3.4	3.4	2.9	2.6	2.6
Overseas (incl. IUU)	3.3	3.3	3.4	3.4	3.1	2.9	2.9	2.9	2.9
Total Capture	7.8	7.6	7.3	7.2	6.5	6.3	5.8	5.5	5.5
Aquaculture '000 t.									
Australia	0.6	0.7	0.8	0.9	0.8	1.0	1.1	1.2	1.2
Other excl. China	9.4	10.3	12.2	13.1	15.2	18.1	19	20	20
China	87	106	110	123	135	149	130	112	112
Total Farmed	97	117	123	137	151	168	150	133	133
Global Supply '000 t	105	125	130	144	158	175	156	139	139
Australia '000 t.	5.1	5.0	4.7	4.7	4.2	4.4	4.0	3.8	3.8
Australia share	4.9%	4.0%	3.6%	3.3%	2.7%	2.5%	2.6%	2.7%	2.7%
China aqua share	83%	85%	85%	85%	85%	85%	83%	81%	81%
China aqua growth	19%	22%	4%	11%	10%	10%	-13%	-14%	0%

Regulatory Framework

The Australian farmed Abalone Sector operates in a complex multi-jurisdictional regulatory environment. Each farm operation is subject to varying levels of regulation from host jurisdictions, including for aquaculture site licensing, biosecurity and stock movement, wastewater, food safety, food labelling, and work health and safety.

While the farmed abalone sector has experienced significant corporate consolidation in the last few years, the disparate regulatory framework across state jurisdictions continues to be a major challenge and disincentive to industry growth and efficiency. On balance, farmers also recognise the positive influence that Australia's advanced biosecurity systems have on their market reputation and seafood supply chains.

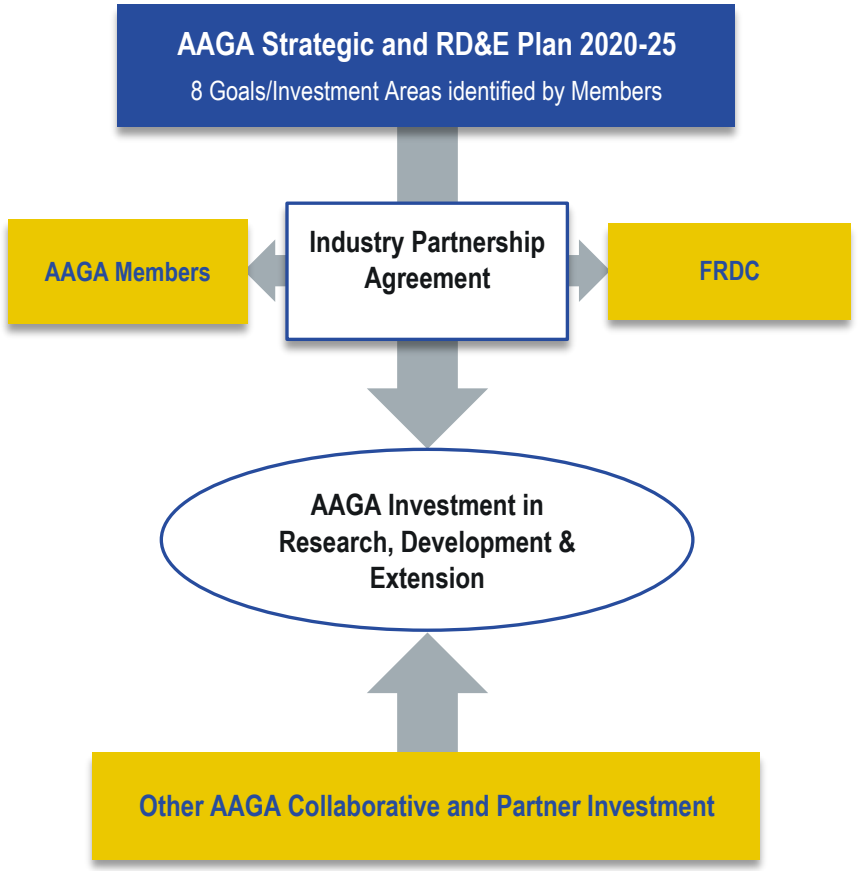
To mitigate the risks and costs of regulation on the sector, AAGA intends to continue to encourage Members and regulators to establish sustainability and biosecurity protocols and standards that address the key environmental, biosecurity, animal health and human health risks, and to enable appropriate 3rd party accreditation and verification. This 2025 Plan includes, among other priorities, support for:

- Development of a national farmed abalone Health Program supported by standard health indicators and farm surveillance,
- Development of a national farmed abalone cross jurisdictional Genetics Program including stock movement,
- AAGA participation in the next AquaPlan and related FRDC-supported standards,
- Harmonised jurisdictional legislation,
- Assessment of the feasibility of a National Stock Loss Self-insurance / insurance.

Industry Partnership Agreement

AAGA Members expect to establish an IPA with FRDC in June 2020 to continue current projects and improve the flexibility, performance and leverage achieved from their collective precompetitive RD&E investments.

Goals and strategies in this 2020-25 Strategic Plan will determine the priorities and leverage the RD&E investment contributed by abalone farmers.



3. RD&E PROGRAM

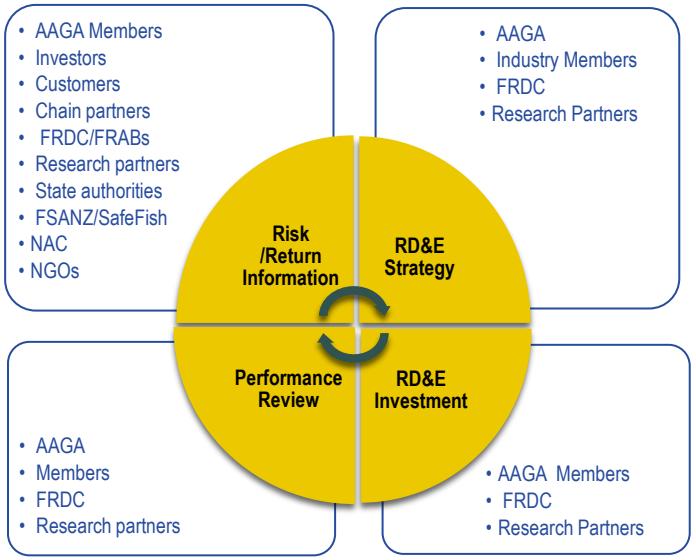
Investment Collaboration

The AAGA Executive and Management Committee work with Members, FRDC and stakeholders to establish strategic and RD&E priorities for precompetitive investment.

The following pages present priority areas, roles, responsibilities, timelines and expected outputs and outcomes.

The Industry Partnership Agreement model for industry investment enables industry funding to be raised and directed to RD&E investment (leveraged funds), AAGA operational costs and other AAGA priorities.

The AAGA and FRDC IPA allows investment in industry specific projects over a specified period against agreed industry strategic needs.



AAGA will establish and manage an RD&E Committee framework that invites and welcomes advice, collaboration and investment from sector stakeholders.

Investment Approval

AAGA Members (comprising >95% of production) voluntarily contribute funds to joint RD&E investment projects, managed with FRDC, and using the levy matching powers of the Commonwealth. A 5-step approval process has been established that a new AAGA RD&E Committee will adopt and implement.

Step 1. Priorities

AAGA Strategic Plan 2020-25 established and published.

Researchers, coinvestors seeking AAGA support for RD&E investment projects must address Plan priorities.

Step 2. Pitch

AAGA engages with researchers, coinvestors, stakeholders and advisers re Plan priorities and projects.

Proponent, researchers, coinvestors must engage early with AAGA leaders to discuss and pitch their RD&E concept. Project concepts are refined early and progressed with clarity and endorsement, or rejected.

Step 3. Performance

AAGA Members seek to achieve a commercial rate of return on their investment in all RD&E activities. Project benchmark rates of return established by AAGA where appropriate.

Subject to its specific investment horizon and projected outcomes, each investment must be able to demonstrate how it will monitor and achieve an acceptable rate of return for assessed risk at or above a benchmark rate established by AAGA.

Step 4. Proposal

AAGA receives formal RD&E proposals from experienced professional researchers, coinvestors and stakeholders.

All proposals to AAGA must clearly demonstrate:

- how the proposal contributes to outcomes described in the AAGA Strategic Plan 2020-25,

- how the proposed investment will achieve a benchmark return acceptable to the AAGA.

Proposals must not contradict Core Values per the AAGA Strategic Plan 2020-25.

Step 5. Project

RD&E Projects considered and approved by AAGA (and FRDC where relevant).

Approved projects will be managed and overseen by AAGA, the AAGA RD&E Committee, (and FRDC where relevant).

Projects must incorporate clear strategies and plans to enable and commit extension of RD&E project outputs and outcomes back to abalone aquaculture farms and industry partners.

Investment Capacity

The following table summarises the actual and forecast Australian farmed abalone harvest and related funding that sector members will contribute under their IPA with FRDC. These funds will be contributed, matched, managed and invested jointly with the FRDC subject to the priorities described in this Plan.

BASE CASE Nominal prices	Years ending June	**2016**	**2017**	**2018**	**2019**	**2020**	**1 2021**	**2 2022**	**3 2023**	**4 2024**	**5 2025**
		Actual	*Actual*	*Actual*	*Actual*	*Actual*[#]	*Forecast*	*Forecast*	*Forecast*	*Forecast*	*Forecast*
Farmed Abalone Harvest	tonnes	815	971	1,149	1,172	1,161	1,438	1,714	1,991	2,249	2,510
Estimated Farm Gate Price	Nominal $/kg	$37.86	$40.00	$42.45	$40.80	$38.00	$38.00	$39.00	$40.00	$41.00	$42.00
Gross Value of Production GVP	$Mill. Nominal	$30.9	$38.8	$48.8	$47.8	$44.1	$54.6	$66.9	$79.7	$92.2	$105.4
Est. Avg. GVP Available for FRDC Matching @ 0.25% of 3 year average	$ Nominal	$71,056	$81,991	$98,723	$112,859	$117,266	$122,159	$138,026	$167,625	$198,932	$231,067
Matching funds from FRDC via IPA	$ Nominal	$71,056	$81,991	$98,723	$112,859	$117,266	$122,159	$138,026	$167,625	$198,932	$231,067
Gross Funding Pool	$ Nominal	$142,112	$163,982	$197,446	$225,717	$234,533	$244,318	$276,052	$335,250	$397,863	$462,134
Less FRDC Management Fee @ 8%	$ Nominal	$11,369	$13,119	$15,796	$18,057	$18,763	$19,545	$22,084	$26,820	$31,829	$36,971
TOTAL IPA Funds Pool Available	$ Nominal	$130,743	$150,863	$181,650	$207,660	$215,770	$224,773	$253,968	$308,430	$366,034	$425,163

[#] These are the most up-to-date actual figures available from AAGA. The figures include Ocean Grown Abalone and non-member AAGA farms. These figures will differ slightly from data reported by ABARES. Production and prices for 2020 were lower than expected due to the impact of the COVID-19 pandemic. AAGA assumes production will recover and grow from 2021.

KEY INVESTMENT AREAS

Investment Area	Objectives and Strategies
1. Farm Innovation	• Establish and implement technologies and procedures to boost farm efficiency • Identify, support adoption of productivity gains via automation • Establish new protocols, technology to improve stock movement • Monitor, report key data- labour costs, product biomass and productivity specs, OHS etc
2. Genetics	• Establish a national AAGA Genetics Program with regulators across all sites to enable and enhance biosecure genetic development • Improve nutrition, protein source, growth, survival and product quality • Understand summer mortality: develop cost-effective solutions
3. Nutrition	• Understand summer mortality: develop cost-effective solutions • Identify alternate proteins - seaweed, sites, species, age, temperature, etc • Understand feed specifications and impacts - improve farmer choices • Understand abalone microbiome and gut health
4. Animal Health & Biosecurity	• Define key national animal health measures and metrics, including for existing and emerging diseases, and benchmarking • Establish a national AAGA Abalone Health Surveillance Program • Understand summer mortality: develop cost-effective solutions • Better understand the link between animal health and farm management
5. Sustainable Farming	• Investigate, enhance the interaction of stocking density - growth - yield • Investigate, benchmark energy efficiency options and greenhouse gases • Investigate climate change science - optimise mitigation and adaptation
6. Human Capacity	• Establish, benchmark basic farm capacity/tools: OH&S, SOPS, training, etc • Establish AAGA program to monitor, document and retain farm staff and improve their career and job satisfaction
7. Market Development	• Engage in selected precompetitive marketing initiatives - scope project and investment concept with leading farm groups - Trademark or brand Australian farmed abalone • Engage wildcatch, chefs and others in collaborative marketing initiatives • Establish, implement common sector grading specs down chain, and reports
8. Governance	• Review, upgrade AAGA Constitution to meet current and emerging needs • Review farm and Member service needs, and EO capacity and resourcing • Establish an RD&E Subcommittee to guide AAGA/FRDC IPA investments • Acquire additional sources of funding to support RD&E Investment

Investment Area 1. FARM INNOVATION

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcome 2025
1. Establish and implement technologies and procedures to boost farm efficiency	Lack of farm innovation and related adoption of technologies and procedures will reduce farm efficiency, competitiveness and viability.	AAGA, FRDC	Long Term	1. Efficient abalone farms using latest technologies and procedures. 2. Modern farm systems - technology, ICT, AI 3. Efficient harvesting and stock movement
2. Identify and support adoption of productivity gains via automation	Terrestrial and aquaculture farm productivity and security can be significantly improved through selective use of the latest farm technology, information and communication technologies, and artificial intelligence. The capital cost investment and returns from these technologies are now compelling for all farms.	AAGA, FRDC, Equipment makers/ suppliers	Long Term	
3. Establish new protocols, technology to improve stock movement	There is increasing need to move abalone stock between farms and across borders. National protocols need to be established to enable movement while ensuring biosecurity is maintained. (Solve the "genetic pollution" argument).	AAGA, FRDC	Long Term	
4. Monitor and report key data - labour costs, product biomass and productivity specs, OHS etc	All Australian abalone farms need to: • Decrease unit costs on farm, especially for labour, • Improve abalone product specifications and related communication to markets, • Improve on farm OH&S management. As Australian farms are relatively small and therefore have high unit costs, any precompetitive investment in monitoring, selective reporting and benchmarking of key metrics will improve sector productivity and outcomes.	AAGA, FRDC	Long Term	

Investment Area 2. GENETICS

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcome 2025
1. Establish a national AAGA Genetics Program	Abalone farmed in Australia are endemic species and therefore their genetics and related science must be researched locally to optimise sector productivity and outcomes. As the downstream impact of abalone genetics is wide ranging (across stocking, nutrition, yield, market outturn, consumer preferences, etc) AAGA will work with regulators across all sites to establish a national genetics program. Two issues of concern are: • Different requirements in different areas, • Regulators preventing trade across state borders based on a genetic pollution argument where farmers are being asked to demonstrate a negative.	AAGA, FRDC	Long Term	1. National AAGA Genetics Program 2. Enhanced performance through genetic leverage and improvement 3. Control of summer mortality
2. Improve nutrition, protein source, growth, survival and product quality	Genetic capacity and optimisation directly impacts farm productivity, supply chain mortality, and consumer choices. Sound investment in abalone genetics will improve farm returns at all stages down the supply chain. Need for a wider pool for industry to draw from, including lines for different characteristics.	AAGA, FRDC	Long Term	
3. Understand summer mortality: develop cost-effective solutions	Summer mortality impacts on farms are a significant risk to farm viability. The science is not yet well documented or understood.	AAGA, FRDC	Long Term	

Investment Area 3. NUTRITION

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcomes 2025
1. **Understand summer mortality: develop cost-effective solutions**	Summer mortality impacts on farms are a significant risk to farm viability. The science is not yet well documented or understood.	AAGA, SARDI, Universities	Medium Term	1. Control of summer mortality 2. Alternate feed proteins 3. Better feed specifications and choices 4. Better Abalone microbiome / gut health
2. **Identify alternate proteins - seaweed, sites, species, age, temperature, etc**	Farms need a better understanding of the nutrition choices available to them on a long-term cost effective basis. AAGA seeks to achieve the most sustainable feeds for Members.	AAGA	Medium Term	
3. **Understand feed specifications and impacts - improve farmer choices**	Abalone feed is a major cost for farms. The apparent variability of commercial feed grades and related manufacturer specifications is concerning for farmers and a risk to farm productivity. Both increased farmer awareness of risks, and clearer feed specifications from suppliers, are necessary to ensure optimum choices on farms.	AAGA, SARDI, Universities, Feed companies	Medium Term	
4. **Understand abalone microbiome and gut health**	Abalone fed on seaweed (Ulva) are more resilient to high water temperatures, at least in laboratory trials. Understanding the microbiome changes between abalone fed seaweed and formulated feed may assist understanding of summer mortality. Progress research into pre and probiotics for improvement of gut health.	AAGA, SARDI, Universities	Medium Term	

Investment Area 4. ANIMAL HEALTH & BIOSECURITY

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcomes 2025
1. **Define a set of key national harmonised animal health measures and metrics, including for existing and emerging diseases, and benchmarking**	Animal health is a major risk to farms and to the sector. A harmonised national program of standard metrics, communications, and measures will create the platform that all farms and regulators need to deliver healthy biosecure farms and translocation protocols.	AAGA, State agencies	Medium Term	1. National Abalone health status metrics 2. National Ab. health surveillance program 3. Identification/ reporting of summer mortality triggers 4. Integrated health and management practices
2. **Establish a national AAGA Abalone Health Surveillance Program**	AAGA helped to establish the AHAP (Abalone Health Accreditation Program), recognised nationally by SCAAH, (Subcommittee on Aquatic Animal Health. AHAP is vital in demonstrating AVG freedom on farms for the purposes of interstate and international trade in live and whole frozen abalone. Expanding the AHAP to other diseases of interest may be required to demonstrate broader disease freedom. (Further discussion required). Collaborative precompetitive investment in Animal Heath and Biosecurity is the most efficient management approach for the sector. AAGA's leadership and engagement with relevant state and national regulators will promote their joint participation and enable a harmonised national program across all farms in all jurisdictions.	AAGA, State agencies	Medium Term	
3. **Understand summer mortality: develop cost-effective solutions**	Summer mortality impacts on farms are a significant risk to farm viability. The science is not yet well documented or understood.	AAGA, State agencies	Medium Term	
4. **Better understand the link between animal health and farm management**	Ill-thrift (poor growth and elevated mortality) is often not understood but may be related to management practices, genetics, nutrition, and water quality, including temperature, dissolved oxygen, ammonia, salinity, pH/CO2. An integrated management approach is required to maximise performance.	AAGA, State agencies and private aquatic vets	Medium Term	

Investment Area 5. SUSTAINABLE FARMING SYSTEMS

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcomes 2025
1. **Investigate, enhance the interaction of stocking density - growth - yield**	Understanding the science and linkage between abalone stock density, growth, and yield is fundamental to farm productivity. This may require a more fundamental approach to the optimisation of water quality parameters. Similar to 4.4 above.	AAGA, FRDC	Medium Term	1. Sustainable Stock density + Growth + Yield 2. Efficient energy use and reduced GHGs 3. Climate change mitigation and adaptation 4. Possible onfarm energy generation and other benefits
2. **Investigate, benchmark energy efficiency options and greenhouse gases**	Energy access, use, emissions and sustainability is increasingly important to farm outcomes and the sector's social license to operate. Include environmental certification, carbon audit etc.	AAGA, FRDC	Medium Term	
3. **Investigate climate change science - optimise mitigation and adaptation**	Effective and demonstrable climate change management and mitigation is fundamental to the niche market brand being developed and claimed by AAGA Members.	AAGA, FRDC, NAC	Medium Term	

Investment Area 6. HUMAN CAPACITY

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcomes 2025
1. Establish, benchmark basic farm capacity/tools: OH&S, SOPS, training, etc	The increasing consolidation, maturity and farm capacity of the sector, means that high cost areas need to be addressed. Human capacity (productivity, efficiency, OH&S, etc) is the highest cost for most farms and one that offers greatest return on investment in the long term.	AAGA, FRDC, Training Institutions	Medium Term	1. Farm capacity benchmarks - OHS, etc 2. Farmer and employee career planning
2. Establish AAGA program to monitor, document and retain farm staff and key researchers improve their career and job satisfaction	The investment in people to increase farm efficiency and productivity will be most effective when employees and key researchers are also supported to coinvest in a long-term career in the abalone aquaculture sector as employees, managers, researchers and leaders.	AAGA, FRDC	Medium Term	3. Better staff/researcher retention and job satisfaction

Investment Area 7. MARKET DEVELOPMENT

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcomes 2025
1. Engage in selected precompetitive marketing initiatives - scope out a project and investment concept with leading farm groups – Trademark or brand Australian farmed abalone	As a small, sustainable, high quality niche producer serving global abalone markets, AAGA Members have a real incentive to collaborate on precompetitive investment in consumer marketing and Australian brand awareness. This includes establishing national quality standards for third party sensory analysis of our abalone.	AAGA, FRDC	Near Term	1. Chef engagement and tours to farms 2. Precompetitive joint generic marketing
2. Engage wildcatch, chefs and others in collaborative marketing initiatives	Engagement with downstream abalone users in consumer markets will enable increased product awareness and loyalty, and greater price leverage than investing solely on-farm.	AAGA, FRDC, DFAT	Medium Term	3. Participation in selected trade shows 4. Investment in social media platforms
3. Establish and implement common sector grading specs down chain, and reports	Harmonised national product grading specifications will improve supply chain and market acceptance of Australian farmed abalone as a category. There is increasing need to move to automated grading of harvested stock by weight following use of relaxants.	AAGA	Long Term	5. Consistent product grading specs and data

Investment Area 8. GOVERNANCE

RD&E Investment Objective	Risks and Rationale	Responsibility	Horizon	Outcome 2025
1. **Review, upgrade AAGA Constitution to meet current and emerging needs**	AAGA's Strategy and Constitution need to be reviewed due to changes since inception, including a national industry perspective. The industry's competitive environment, and the association's membership, structure and intent, have changed in recent years. AAGA's documents need to be modernized to enable appropriate governance.	AAGA Executive Officer & AAGA Committee, FRDC	Near Term	1. AAGA Constitution that meets needs 2. Better RD&E funding and investment management (e.g. CRC Project) 3. Adequate AAGA service capacity
2. **Review farm and Member service needs, and EO capacity and resourcing**	Industry challenges call for new and amended services and communication technology to support Members. The role of the part-time EO is under pressure and needs to be monitored to enable an efficient AAGA.	AAGA Executive Officer & Committee, FRDC	Near Term	
3. **Establish an RD&E Subcommittee to guide AAGA/FRDC IPA investments**	By global standards, our farms are small but sustainable. Improved, efficient, precompetitive RD&E investment is a key pathway to leveraging the global market niche that AAGA Members are jointly building.	AAGA, FRDC	Near Term	
4. **Acquire additional sources of funding to support RD&E Investment**	The breadth of potential projects outlined in this Strategic Plan requires much greater funding than currently available. Rigorously managed, integrated, outcome focussed RD&E projects that attract additional outside funds are required.	AAGA FRDC, (e.g. ARC, CRC-P, CSIRO, Universities, etc)	Near Term	

INVESTMENT PLAN

The following table is intended as a forecasting tool reflecting the aspirations and priorities identified in the February 2020 AAGA Strategic Planning workshop. AAGA's investment plan needs flexibility to respond to changing risks, priorities and opportunities, as the coronavirus pandemic has reconfirmed.

FORECAST GROWTH	Years ending June	**2016**	**2017**	**2018**	**2019**	**2020**	Total 2016-20			**1. 2021**	**2. 2022**	**3. 2023**	**4. 2024**	**5. 2025**	Total 2021-25
		Actual	*Actual*	*Actual*	*Actual*	*Actual*				*Forecast*	*Forecast*	*Forecast*	*Forecast*	*Forecast*	
Harvest	tonnes	815	971	1,149	1,172	1,161	5,268			1,438	1,714	1,991	2,249	2,510	9,903
Farmgate Price	$/kg	$37.86	$40.00	$42.45	$40.80	$38.00				$38.00	$39.00	$40.00	$41.00	$42.00	
Est. Sector GVP	$Mil.	$30.9	$38.8	$48.8	$47.8	$44.1	$210.4			$54.6	$66.9	$79.7	$92.2	$105.4	$398.8
Est. IPA RD&E Funds Pool Available	$Nom.	$130,743	$150,863	$181,650	$207,660	$215,770	$886,687			$224,773	$253,968	$308,430	$366,034	$425,163	$1,578,368
Investment Area								Planned Investment Horizon and Expenditure							
1. Farm Innovation	$Nom.							Long Term	19%	$42,707	$48,254	$58,602	$69,546	$80,781	$299,890
2. Genetics	$Nom.							Long Term	19%	$42,707	$48,254	$58,602	$69,546	$80,781	$299,890
3. Nutrition	$Nom.							Medium Term	18%	$40,459	$45,714	$55,517	$65,886	$76,529	$284,106
4. Animal Health & Biosecurity	$Nom.							Medium Term	10%	$22,477	$25,397	$30,843	$36,603	$42,516	$157,837
5. Sustainable Farming	$Nom.							Medium Term	5%	$11,239	$12,698	$15,422	$18,302	$21,258	$78,918
6. Human Capacity	$Nom.							Medium Term	5%	$11,239	$12,698	$15,422	$18,302	$21,258	$78,918
7. Market Development	$Nom.							All Terms	5%	$11,239	$12,698	$15,422	$18,302	$21,258	$78,918
8. Governance	$Nom.							Near Term	19%	$42,707	$48,254	$58,602	$69,546	$80,781	$299,890
TOTAL	$Nom.								**100%**	**$224,773**	**$253,968**	**$308,430**	**$366,034**	**$425,163**	**$1,578,368**

Glossary

AAGA	Australian Abalone Growers Association
AI	Artificial intelligence
AVG	Abalone Viral Ganglioneuritis
DFAT	Commonwealth Dept of Foreign Affairs and Trade
EU	European Union
FRDC	Fisheries Research and Development Corporation
IPA	Industry Partnership Agreement
ICT	Information and communication technology
IUU	Illegal, Unreported and Unregulated fishing
NAC	National Aquaculture Council
NGOs	Non-government organisations
OH&S	Occupational health and safety
SIA	Seafood Industry Australia
State Agencies	Convenient collective term for the variously named state departments administering aquaculture and fisheries