



Naturland

NATURLAND STANDARDS

ORGANIC AQUACULTURE

Version 05/2023

Summary of Naturland's Standards

Part A. General regulations governing production

- I. Contracts and certification procedures
- II. General (management) regulations resp. other predominant provisions
- III. Social responsibility

Part B. Regulations for the individual branches of production

- I. Plant production
 - II. Livestock production
 - III. Market gardening
 - IV. Cultivation of shoots and germ buds
 - V. Mushroom cultivation
 - VI. Cultivation of ornamental plants, herbaceous perennials, shrubs, Christmas trees
 - VII. Fruit cultivation
 - VIII. Viniculture
 - IX. Permanent tropical plantations
 - X. Wild grown products
 - XI. Beekeeping
 - XII. Aquaculture
 - XIII. Organic forest management
 - XIV. Insect breeding
- Appendices production

Part C. General processing standards

- I. Goals
- II. Area of application
- III. Contracts
- IV. Inspection and certification
- V. Product identification/labelling
- VI. General regulations and other predominant (production) provisions
- VII. Social responsibility

Part D. Processing standards for specific groups of products

- I. Processing standards for meat and meat products
 - II. Processing standards for milk and dairy products
 - III. Processing standards for bread and bakery products
 - IV. Processing standards for cereals, cereal products and noodles
 - V. Processing standards for feed
 - VI. Processing standards for aquaculture products and products from sustainable capture fishery
 - VII. Processing standards for breweries
 - VIII. Processing standards for vegetables and fruit as well as spices and herbs
 - IX. Processing standards for the production of wine, semi-sparkling wine, sparkling wine, fruit wine, wine vinegar, cleared concentrated grape must/sweet reserve, liqueur wine and spirits
 - X. Processing standards for edible fats and oils
 - XI. Processing standards for yeast, yeast products as well as leaven and natural fermentation starter
 - XII. Processing standards for microalgae and microalgae products for human consumption
 - XIII. Processing standards for textiles
 - XIV. Processing standards for cosmetic products
 - XV. Processing standards for pet food
 - XVI. Processing standards for production and provision of food and beverages in communal catering establishments
 - XVII. Processing standards for transport and slaughtering
 - XVIII. Processing standards for confectionery products and sweeteners
 - XIX. Processing standards for plant-based foodstuffs
- Appendices processing

Table of contents

Preface	6
Scope of application of the standards	7
Part A. General regulations	7
<u>I. Contracts and certification procedure</u>	7
1. Prerequisites for granting the producer contract	7
2. Producer contract	7
3. Standards	7
4. Conversion	8
5. Changes in the farming system	8
6. Documentation and inspection	8
7. Certification	9
8. Labelling and marketing	9
<u>II. General (management) regulations resp. other predominant provisions</u>	10
1. Sustainable management	10
2. Quality assurance	10
3. Non-employment of GMO and GMO derivatives	10
4. Non-use of nanomaterials	10
5. Storage	11
6. The sale of purchased merchandise	11
7. Purchase of means of production and equipment	11
8. Exchange of farming equipment between different agricultural operating systems (certified organic/conventional)	11
9. Use of foil and fleeces, nets and technical mulching materials	11
10. Biogas plants	12
<u>III. Social responsibility</u>	13
1. Human rights	13
2. Freedom to accept or reject employment	13
3. Freedom of association, access to trade unions	13
4. Equal treatment and opportunities	13
5. Children's rights	13
6. Health and safety	13
7. Employment conditions	13
Part B. Regulations governing organic aquaculture	15
<u>I. Principles of Management</u>	15
1. Selection of site, interaction with surrounding ecosystems	15
2. Species and origin of stock	15
3. Breeding, hatchery management	16
4. Design of holding systems, water quality, stocking density	16
5. Polyculture	17
6. Health and Hygiene	17
7. Oxygen Supply	18
8. Organic Fertilising	18
9. Feeding	18
10. Transport, slaughtering and processing	19
11. Documentation	19
12. Smoking	20
<u>II. Supplementary regulations for the culture of carp (<i>Cyprinus carpio</i> among others) in ponds</u>	21
1. Close-to-nature design of the ponds	21
2. Construction of ponds, quality of water	21
3. Stocking density and feed	21
4. Health and Hygiene	21

5. Organic Fertilising	21
6. Transport, slaughtering	21
<u>III. Supplementary regulations for the culture of Salmonidae (e.g. trout <i>Salmo trutta</i>, <i>Oncorhynchus</i> sp., salmon <i>Salmo salar</i>, charr <i>Salvelinus</i> sp., whitefish <i>Coregonus</i> sp.) in ponds, flow-through systems and net cages</u>	23
1. Site selection	23
2. Prevention of water pollution, natural design of the ponds	23
3. Stocking density	24
4. Health and hygiene	24
5. Feeding	25
<u>IV. Supplementary regulations for the marine culture of mussels (e.g. <i>Mytilus edulis</i>) on ropes and frames</u>	26
1. Site selection, interactions with the surrounding ecosystems	26
2. Type and origin of stock	26
3. Culture systems	26
4. Processing	26
<u>V. Supplementary regulations for the pond culture of crustaceans (shrimps <i>Litopenaeus vannamei</i>, <i>Penaeus monodon</i>, <i>Macrobrachium rosenbergii</i> and crayfish <i>Astacus astacus</i>, among others)</u>	27
1. Site selection, protection of mangroves	27
2. Protection of ecosystems – farm area and surrounding	27
3. Origin of stock	28
4. Breeding, hatchery management	28
5. Pond design, water quality, stocking density	28
6. Health and hygiene	29
7. Fertilising of ponds	29
8. Feeding	29
9. Harvesting and processing	30
<u>VI. Supplementary regulations for the culture of tropical freshwater fishes (e.g. milkfish <i>Chanos chanos</i>, tilapia <i>Oreochromis</i> sp., Siamese catfish <i>Pangasius</i> sp.) in ponds, flow-through systems and net cages</u>	31
1. Site selection	31
2. Water pollution control, natural design of ponds	31
3. Special provisions for the design of pond and flow-through systems for tilapia	32
4. Stocking density	32
5. Breeding, hatchery management	32
6. Health and hygiene	32
7. Feed	32
<u>VII. Supplementary regulations for the culture of <i>Perciformes</i> (perch-like), <i>Carangiformes</i> (jack-like) and <i>Gadiformes</i> (cod-like) fish species in marine net cages</u>	33
1. Site selection	33
2. Prevention of water pollution	33
3. Stocking density	33
4. Health and hygiene	33
<u>VIII. Supplementary regulations for the cultivation and collection of marine macroalgae (<i>Chlorophyceae</i>, <i>Phaeophyceae</i>, <i>Rhodophyceae</i>)</u>	34
1. Selection of site, interaction with surrounding ecosystems	34
2. Cultivation	34
3. Collection of wild seaweed	34
4. Post harvest	35
<u>IX. Supplementary regulations for the cultivation of microalgae for human consumption (e.g. <i>Spirulina</i>, <i>Chlorella</i>)</u>	36
1. Cultivation systems	36
2. Requirements for the culture media	36
3. Waste water quality	36
4. Quality assurance	36

5. Cleaninig and disinfection	36
Appendices aquaculture:	37
Appendix 1: Requirements regarding fishmeal/-oil used as feed	37
Appendix 2: Wild grown algae species currently excluded from organic certification:	37
Appendix 3: Permissible cleaning and disinfection substances	37
Appendix 4: Requirements with respect to keeping cleaner fish in net cages (e.g. lumpfish <i>Cyclopterus lumpus</i> , ballan wrasse <i>Labrus bergylta</i> , cuckoo wrasse <i>Labrus mixtus</i> , goldsinny wrasse <i>Ctenolabrus rupestris</i>)	38

Preface

Introduction

Certified organic agriculture, as practised in accordance with the written standards of Naturland - Registered Association for Organic Agriculture - has become an established concept. A comparison of the first draft of the "Standards for Organic Agriculture" passed in 1982 after the association was founded with the currently valid version will reveal two aspects of this modern form of land cultivation and the processing of the resulting products: on the one hand its dynamism and potential for development and on the other its stability and consistency. The development of standards and their implementation are the core mission of any certified association for organic agriculture. Standards have to be proven to be workable. They have to be adapted to changing conditions and be extended to cover new areas. The growth of Naturland and its organisations since the association's establishment is a reflection of the success of its work and confirms that this form of cultivation has gained wide acceptance and appreciation among farmers, food producers and consumers.

Standards for specific areas

The Naturland standards existed long before the EU passed its first legal regulations on organic agriculture. Even today the consistent development of our standards provides major impetus; they incorporate ideas that are taken seriously by the legislators.

As they stand today, Naturland's standards are not limited solely to the specific method of cultivation described in detail in its standards on plant production and animal husbandry. For some years now, standards have been developed to cover many specific areas which require special guidelines, such as horticulture and viticulture, bee-keeping, harvesting of wild grown products, and aquaculture. In the same measure that the standards have evolved to cover various forms of cultivation, they also incorporate the next stage - the processing of this produce. The production and processing of food produce, such as bread and bakery products, milk and dairy products, beer and meat, etc. are described in specific standards for different categories of food produces. Whilst foodstuffs are the original sphere of interests, standards have also been drawn up to cover other areas of cultivation, such as organic forestry and timber processing.

Adherence to the elementary principles

To ensure that Naturland's standards develop consistently, it is essential that the fundamental principles of organic agriculture are adhered to. It is also crucial to withstand hasty and short-lived trends and any temptation to sacrifice elementary principles for the sake of immediate success. Standards can only provide a framework, since organic agriculture cannot function on the basis of mere regulations. It is realised by consensus on a common aim. Nevertheless, exact and binding rules are necessary in practice, whilst leaving enough flexibility for adaptation to the particular requirements of each agricultural operation.

The experts - farmers, consumers, processors and scientists - who contribute to the development of Naturland's standards have always offered new solutions to the problems posed. The framework of Naturland's standards is dictated by the core fundamental principles of certified organic agriculture: the obligation to treat the elementary basics of our lives with prudence and responsibility. A common starting-point, sustained management, the active protection of nature and the climate, safekeeping and preservation of the soil, air and water and the protection of the consumers are at the heart of all Naturland's standards. This also implies tolerance, the respectful treatment of one's fellow human beings and the acceptance of social responsibility.

Naturland's standards - basis for certification

Standards will only endure and make a lasting impact if they can be clearly monitored and be put into consistent practice. Any decisions involved have to be seen to be made impartially and on neutral, unbiased terms. This is guaranteed by calling on the services of independent and autonomous committees - standards committee, inspection body and certification committee - as well as by the composition of the committees - consisting of diverse interest groups such as scientists, agriculturists and consumers. Independent inspection procedures and the consistent application of Naturland's standards form the basis of the production of high quality products cultivated in a balance with nature and the environment. This quality is visibly documented by the Naturland logo.

Naturland's quality management - national and international

For producers, processors and consumers, certification by Naturland stands for a reliable quality management system, for the dependability of the organically grown produce, from its cultivation to the finished product.

Naturland has been accredited to the international norm ISO/IEC 17065 since 1998. This accreditation confirms that certification is performed to defined norms.

Scope of application of the standards

These standards relate to the species of animals and algae cited in the Special Part B, which are cultivated or (for macroalgae) collected under the conditions described therein (culture system, geographical or climatic conditions). For species of animals and algae not cited in the Special Part B, the General Farming Principles (B. I) in conjunction with the respectively existing farming system (B. II. - IX.) apply.

Part A. General regulations

I. Contracts and certification procedure

1. Prerequisites for granting the producer contract

Prior to the conclusion of a producer contract, the association must be given the opportunity to acquire sufficient information on the external and internal conditions of the operation.

This enterprise is obliged to provide any information necessary to assess the conversion conditions. This includes particularly the method of farming that has been practised to date (type and numbers of stock, use of mineral fertilisers, hygienic measures etc.), the economic situation of the farm and the prevailing environmental conditions (information regarding the bodies of water in the bordering areas and regarding the neighbouring ecosystems, sources of possible threats such as industrial plants).

If possible causes of contamination with dubious or harmful substances are detected, analyses have to be produced or tests carried out prior to the conclusion of a producer contract. These analyses may show that a producer contract is only possible under specific conditions or not at all. A comprehensive description of all the water bodies and of the production and storage sites has to be made. Naturland is entitled to ask for the production of an environmental audit before certification.

2. Producer contract

On signing the producer contract, the producer commits himself to adhering to Naturland standards and to extending the conversion to all areas of the enterprise that are managed or farmed under his responsibility (whole farm conversion).

The principle of the manager's unit is to be applied, i.e. one and the same farm manager must not manage a conventional and an organically operated farm at the same time¹.

The conclusion of a producer contract is possible at any time of the year.

The conclusion of a producer contract does not entitle the producer to the use of the association's logo. A separate licence contract has to be concluded for this.

3. Standards

These standards are obligatory for all producers that have concluded a producer contract with Naturland. If single regulations or parts of these standards should not be applicable under different climatic conditions, the Naturland standards committee has to draft an amendment or addition to the standards which has to be passed by the assembly of delegates. Naturland's certification committee is entitled to allow a producer contractor to diverge from Naturland's standards in specific points, where the exception is justified, and for a limited period of time, provided that the general management of the farming operation according to Naturland's standards is not adversely affected.

Only the latest version of the standards as passed by the assembly of delegates is valid. Naturland will inform the contractual producers of any changes. If the standards are changed, a deadline can be set for the implementation of these changes.

Violations of the standards will be prosecuted according to the sanction catalogue (Appendix to the producer contract).

The validity of overriding state legislation and ordinances shall, however, remain unaffected by these standards. The requirements of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended have to be observed.

¹ Manager's unit: composed of manager and farming unit. The manager is the natural person running a farm independently and responsibly (farm manager). The farming unit is a clearly marked managing sphere on which distinctly separate records are kept for inspection and documentation.

4. Conversion

During conversion to organic aquaculture, the manager introduces management practises in accordance with the principles of organic agriculture throughout the entire operation.

The official start of management in accordance with these standards is marked by the provable last management measure not permitted by the standards.

The following conversion periods for conventional aquaculture production units shall apply for the following types of aquaculture facilities including the existing aquaculture animals and algae²:

- a) For facilities that cannot be drained, cleaned and disinfected, a conversion period of 24 months;
- b) For facilities that have been drained, or fallowed, a conversion period of 12 months;
- c) For facilities that have been drained, cleaned and disinfected a conversion period of six months;
- d) For macroalgae a general conversion period of six months;
- e) For open water facilities including those farming bivalve molluscs, a three month conversion period.

The following conversion periods³ apply for aquaculture production units which are certified to the standards of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended or recognised in accordance with said regulation or for farms which comply with Naturland's quality assurance requirements including those pertaining to existing livestock and algae⁴:

- a) For facilities that cannot be drained, cleaned and disinfected, a conversion period of 6 months;
- b) For facilities that have been drained or fallowed, a conversion period of 4 months;
- c) For facilities that have been drained, cleaned and disinfected a conversion period of 3 months;
- d) For open water facilities including those farming bivalve molluscs and algae, a conversion period of 3 months.

The conversion of the entire farm must occur under economically acceptable basic conditions. It can therefore take place gradually to cover ever greater areas of the farmland cultivated in accordance with the standards. Where conversion is carried out gradually, it is imperative for the areas under various stages of conversion to be clearly and explicitly delineated. Simultaneous production of products belonging to different stages of certification that cannot be clearly differentiated is not permissible. The conversion of the entire farming operation, in the case of gradual implementation, must be completed within 5 years at the latest.

In a conversion plan to be worked out, in particular, all those structural changes possibly becoming necessary, the type and numbers of stock and the feeding schedule as well as the hygienic measures intended shall be documented.

Naturland can demand the submission of the latest water and sediment analyses.

It is possible to commence conversion at any time of the year.

5. Changes in the farming system

If new areas are introduced into a farming operation either by way of purchase or lease, then the livestock kept on that area has to comply with the usual conversion period (ref. I.4 of these standards).

If the same species is cultivated both in an area already converted and on other(s), still in the conversion phase, then attention has to be paid to appropriate physical demarcation and separate identification of the production units. Switching between organic and conventional farming method is prohibited.

6. Documentation and inspection

The currently valid details (i.e. type and size of the stock, large-scale transport of stock, e.g. to net cages located some distance away) shall be reported to Naturland. Regarding product flow (e.g. additional purchases of feed as well as the sale of farm products), likewise, records shall be kept in accordance with Naturland's standards. Furthermore, a farm diary shall be kept (e.g. on the incidence of diseases, mortality rates, implementation of special hygienic measures such as dewatering, liming etc.). An obligation for an immediate reporting shall exist in respect of all such factors that can negatively affect the quality of the products (e.g. contamination of water sources, occurrence of toxic algae blooms or „red tides“).

² Where livestock and algae stock are being converted, they must be managed according to Part B.I.2 Species and origin of stock.

³ Proof must be provided of environmental analyses as well as of treatments administered throughout the production cycle of the existing stock.

⁴ The conversion of the existing livestock and algae stock takes place regardless of the age of the stock.

Previously announced (at least once a year) and unannounced visits and inspections by personnel authorised by Naturland shall monitor adherence to the standards. They shall be provided with unrestricted access and scrutinising opportunities into all the relevant areas of the farm. Upon request, all the documents relating to the managing of the farming operation as well as any other relevant information shall be made available.

All stages of the value chain have to be recorded when the farm is inspected, although, in the case of co-operatives, for example, individual areas can be organised to conform with the internal control system (ICS). Where third parties operate on behalf of the producer (e.g. treatment, storage, processing, transport), the processor must take steps (such as the conclusion of a sub-contracting agreement) to ensure that the standards are applied and that adherence to them can be monitored by Naturland.

Moreover, the farm and Naturland together determine the following conditions which have to be complied with:

- a list of the contaminants and noxious substances (from both anthropogenic and natural sources) that are relevant to the region and the type of production
- the frequency of and processes used in the analysis of these pollutants (with reference to the water, sediment, feed and products)
- alert values of max. 50% of the critical German legal level⁵, at which Naturland must be notified
- threshold values leading to the exclusion of the product from marketing (as a rule the German legal critical values⁵).

7. Certification

The Naturland certification committee confirms that the producer is adhering to the standards with the annual certification letter. If the producer violates current standards, the penalties listed in the catalogue of sanctions, which is part of the producer contract, can be imposed. It is standard practice for complaints in connection with matters within Naturland's sphere of responsibility to be addressed to Naturland's head offices in Gräfelfing, Germany.

8. Labelling and marketing

The labelling of products enables the trader legally responsible for the product to be identified.

The provisions of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended, as far as they apply to the EU Community logo and the declaration of origin (place where the aquaculture products were produced) are to be observed.

The producer is only allowed to label products with reference to Naturland if a licence agreement has been concluded for the products in question.

The deadlines and conversion periods stated in Part A.I.4 apply for aquaculture production units including the existing livestock and algae stock during conversion in order to be considered as managed in accordance with the standards.

When purchasing young stock from conventional farms, the regulations stated in the list of priorities shown under section B.I.2 apply, namely that the stock must have been raised and fed for at least 2/3 of its total lifetime in accordance with the standards before it may be sold with any reference to organic production or to Naturland or bearing the Naturland trademark*.

⁵ If corresponding critical values are not available, reference should be made those of WHO or other professional bodies.

* Currently there are differences between the EU regulation on Organic Aquaculture and the requirements on the sourcing of stocking animals or on measures for the production of spawn in the Naturland standards. This has to be taken into account if the corresponding produce are to be marketed as "organically produced" within the territory governed by the EU Organic Regulation.

II. General (management) regulations resp. other predominant provisions

1. Sustainable management

Organic agriculture is particularly committed to sustainable management. This includes the respectful treatment of nature and the environment, the sustainable use of natural resources, the acceptance of social responsibility and the maintenance of economic performance.

The benefits derived from natural ecosystems and their economic performance must be maintained. Damage to ecosystems should be kept to a minimum.

Biological diversity or biodiversity is to be maintained and fostered on farms to the best of the farmer's ability; this includes diversity of ecosystems, diversity of species and genetic diversity. Sites containing areas of high conservation value (HCV⁶) are subject to special safeguarding provisions.

Water and soil are valuable natural commodities whose protection is of crucial importance and which must therefore be used carefully and sustainably.

Energy should be used as efficiently as possible and renewable energy resources should be used for preference. Wherever waste is unavoidable, it should be disposed of in an eco-friendly manner or recycled. Organic residues should be re-used and preferably composted.

Preference is to be given to procuring raw materials and goods from suppliers in close proximity.

2. Quality assurance

Production in terms of these standards should allow for organic produce of high sensory quality and safety in regard to health. To avoid contamination with prohibited substances or means which might impair the organic quality, appropriate measures shall be taken. In particular, the operation must show from its procedures that possible environmental pollutants are monitored by suitable analytical methods and that prompt and comprehensive measures are taken in cases where limits are exceeded.

Where reasonable suspicion exists that the product quality is substantially impaired through contamination, Naturland should be informed. Naturland may require an analysis to be undertaken to detect the level of contamination and contamination sources and follow up on the case. Appropriate action has to be taken on complaints related to the compliance with Naturland certification requirements that are directed to the operation by third parties. Records shall be kept of the complaint and corrective action taken.

3. Non-employment of GMO and GMO derivatives

Genetically modified organisms (GMOs) and their derivatives are incompatible with organic production. Products produced according to the Naturland standards must therefore be manufactured throughout the whole of their production and value chain without the use of genetically modified organisms (GMOs) and GMO derivatives⁷.

The definitions given under sec. 2 of Directive 2001/18/EC of the European Parliament and of the Council, and the exclusion criteria for genetic engineering of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended apply.

Even the unintentional contamination of products certified by Naturland with genetically modified organisms may also lead to certification being denied.

4. Non-use of nanomaterials

By "nanomaterials", Naturland means: substances which have been consciously and deliberately designed, technically manufactured or produced by human inducement (anthropogenic) with the intention of obtaining very specific characteristics (e. g. shape, surface properties or chemical properties) at the nanoscale (approx.

⁶ Definition: <https://www.hcvnetwork.org/hcv-approach>

⁷ A "GMO derivative" is any substance produced from or by means of GMOs but not containing any GMOs itself. "The use of GMOs and GMO derivatives" means their use as a foodstuff, an ingredient of foodstuffs (including additives and flavouring), processing additives (including extraction solvents), animal feed, compound feed, the raw materials of animal feed, fodder additives, processing additives for animal feed, certain products for animal feed, pesticides, fertilisers, soil ameliorators, seed, vegetative propagation material and animals. For the purposes of these standards, the following definitions apply: 1. organism: any biological unit capable of reproduction or passing on genetic material. 2. genetically modified organism (GMO): an organism, the genetic material of which has been modified in such a way as is not possible in a natural manner by cross-breeding and/or natural recombination.

1 – 300 nm in at least one dimension) such as only possible at the nanoscale. Particles with larger diameters may come under this definition in cases where there is evidence of effects specific to the nanoscale at this size. Particles accidentally generated at the nanoscale, which can occur in the course of traditional processing methods (such as, for example, homogenisation, grinding, foaming, freezing) or as natural environmental elements (e. g. volcanic or airborne particles) or in foodstuffs (e. g. monosaccharides, amino acids or fatty acids) at the nanoscale are excluded from this definition.

The environmental effects on nanomaterials and their impact on human beings are so far not sufficiently known. For this reason, products grown and processed and certified by Naturland must be manufactured without the application of anthropogenic nanomaterials. Nanomaterials should also be avoided in packaging. They are only permissible if the nanomaterials are firmly integrated in the packaging material. Nanomaterials in layers or coatings which are in direct contact with products certified to the Naturland standards must not be used.

5. Storage

Storage under special conditions (controlled atmosphere, temperature control, humidity regulation and drying of the stored goods) is permitted. The application of chemical storage-protection agents is prohibited. Only storage measures that exclude the contamination of the harvest with harmful substances are permitted. This also applies to the materials and detergents used (ref. the regulations of Part C. General Processing Standards VI. 11, where they apply to pest control). Radioactive irradiations are prohibited.

If there are products of different certification statuses on the farm, they have to be stored clearly separated. Substances which are prohibited by these standards and contravene the conversion status in question may no longer be stored on the farm (ref. also Part C. General Processing Standards VI 9. Storage, Bottling, Bagging and Transport).

6. The sale of purchased merchandise

The sale of purchased products for direct marketing, e.g. on market stalls, is possible. Regional products should be preferred wherever possible. Separate bookkeeping for all the purchased merchandise has to be done. The labelling of the products must be unequivocal with respect to their origin and method of production. Farm products and bought products have to be declared separately.

Conventional merchandise may only be sold if there is proof that equivalent organic or sustainably produced products are not available. These products have to be clearly labelled as "conventionally produced".

It is not permissible to offer one and the same product from organic and conventional cultivation or fishery at the same time.

7. Purchase of means of production and equipment

Special attention has to be paid to the ecological impact of production means and equipment. Preference is to be given to substances on a natural basis (e.g. oils, fats). Auxiliary materials of rainforest timber are prohibited. Care should be taken to save energy.

8. Exchange of farming equipment between different agricultural operating systems (certified organic/conventional)

The exchange of machinery and equipment (e.g. in machinery co-operations) between certified organic aquacultures and conventional operations is possible. Machines and equipment that are also utilised by conventional aquacultures must be cleaned thoroughly in the case of contamination with substances that do not comply with Naturland's standards before being used on a Naturland operation.

9. Use of foil and fleeces, nets and technical mulching materials

Decomposable matters are to be striven for, e.g. cotton, flax mats, mulching paper or organic foil, as far as these allow a reasonable organic cultivation.

For protected structure coverings like plastic mulches, fleeces, insect netting and silage wrapping, only products based on polyethylene (PE) and polypropylene (PP) or other polycarbonates are allowed. These shall be removed after use and shall not be burned on the farm land. The use of polyvinyl chloride (PVC) based products is prohibited. Recycling is recommended.

Materials that are on the farm already and do not comply with these conditions may be used up during the conversion period.

10. Biogas plants

Generating energy by fermenting biomass can be an important component of future energy supply within the context of renewable energy as a whole, besides wind, water, solar and geothermal energy and combustion of organic materials like wood.

Biogas plants in the organic farm combine the production of regenerative energy in a sustainable manner with the production of high-quality and healthy food, because they mainly use waste materials, allow varied crop rotations and are very energy-efficient. Plant capacity and use should be in reasonable relation to the area of operation, so that the principle aim, food production, is guaranteed.

Sensible waste heat utilisation and very high overall efficiency are to be aimed at, to achieve greatest energy efficiency.

10.1 Biogas plants on Naturland farms

Biogas plants on Naturland farms⁸ are run basically with ecologically generated fermentation materials. Vegetable material from conventional production⁹, which serves as fermentation material to operate the power plant, is limited to max. 30%. Fermentation materials of conventional origin must comply with appendix 1 of Naturland standards on production (permissible purchased fertilisers and soil improvement agents). If certain conventionally produced substrate components are to be found on the farm at the same time as animal feed in organic quality, then the components from conventional sources must either be denatured (e. g. by adding slurry or manure, covering them with such materials, or similar measures) or be unmistakably identifiable (e. g. dyeing with food colouring, or similar measures). Naturland must be informed of the method chosen beforehand.

Where fermentation materials of more than 0.5 DU/ha/year are used for the operation of the biogas plant, then the delivery of any amount of fermentation substrate supplied which exceeds this value must be documented.

If it is necessary to co-operate with other agricultural operations to operate a biogas plant in order to acquire the necessary amounts of fermentation materials, preference should be given to organic farms.

10.2 Co-operation of Naturland farms with other biogas plants

If it is possible to co-operate with a biogas plant on a local organic farm, this shall take precedence over co-operation with a conventionally run plant.

Where a Naturland farm co-operates with a conventional biogas plant, it is only possible to take back digestate if the original matter came from the Naturland farm (e.g. clover grass). In addition, the conditions stipulated in appendix 1 of Naturland standards on production (permissible fertilisers and soil improvement agents) or B.I.3 (humus management and fertilisation), in particular the maximum amounts allowed, are to be observed¹⁰.

⁸ This also applies to plants which are operated by the manager of a Naturland farm as autonomous legal entities or to collectively owned plants in which he or she holds a share and are not covered by item 10.2.

⁹ Clover grass resp. grass free of mineral fertilisers and synthetic chemical pesticides is a permissible exception.

¹⁰ Naturland must be notified of the intention to take back digestate and this may only be done in compliance with Naturland's regulations. Digestate from biogas plants which are run solely on conventional fermented matter or on genetically modified organisms from aggregates or on liquid manure and poultry dung from conventional animal husbandry, is prohibited. No more than 15% more of the nutrient equivalent than the amount of fermentation materials originally supplied may be taken back.

III. Social responsibility

The holistic claim of Naturland standards also includes the social treatment of the people who work and live on the operations.

1. Human rights

The basic rights of the people living and working on Naturland operations are respected. They must comply at the minimum with the local legal requirements, respectively the human rights listed in the UN Conventions, the International Labour Organisation Conventions and Recommendations (ILO)¹¹, the UN conventions on children's rights¹² and the United Nations Declaration on the Rights of Indigenous Peoples¹³, should these be more comprehensive.

A product created under conditions violating basic human rights, under gross violation of social justice or infringing indigenous land and water rights can not be traded as a product certified by Naturland.

2. Freedom to accept or reject employment

The operations commit themselves to rejecting forced labour and any type of involuntary work. The operation shall not retain any part of the workers' salaries, benefits, property, or documents in order to force workers to remain on the operation.

3. Freedom of association, access to trade unions

All workers have a right to freedom of association and collective bargaining, and are at liberty to exercise this right.

No one shall be discriminated against because of his or her membership in a trade union.

4. Equal treatment and opportunities

No discrimination on the basis of race, creed, sex, political opinion or membership shall be tolerated. All workers, irrespective of their sex, skin colour or religion receive the same pay and have the same opportunities for work of the same nature and same degree of responsibility.

5. Children's rights

No children shall be employed on operations. Children may work on the farms of their own families or a neighbouring farm provided that:

- the work is not hazardous and endangers neither the health nor the safety of the children
- the work jeopardises neither the educational nor the moral, social or physical development of the children
- the children are supervised by adults while working or have been given permission by a parent or legal guardian

6. Health and safety

All workers, employees and their families shall have access to drinking water, food, accommodation and basic medical care.

The employer is responsible for safety, health and hygiene at the workplace. If necessary, this implies holding training courses for employees to raise their awareness of any dangers at their workplace and of the contents of hygiene standards. Operations with more than 10 workers have to draw up a policy on safety at work and make these available to all employees.

7. Employment conditions

Workers for the purpose of these standards are, besides the permanent workers, also seasonal workers and sub-contracted workers.

¹¹ <http://www.ilo.org/declaration/lang--en/index.htm>

¹² <http://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

¹³ http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

All operations commit themselves to meeting the following requirements¹⁴.

7.1 Contracts

All workers receive a written contract of employment describing the basic conditions of employment.¹⁵ Working conditions and contracts have to be documented by the employer to be verified at any time. The employment contract shall at least define the following: job description, scope and limits of the job, and type as well as amount of remuneration. The employment conditions of all workers have at least to comply with the respective higher of the requirements of national regulations and ILO standards.

7.2 Equal treatment

The different kinds of employment shall in no case result in the unequal treatment of any workers: all workers are considered to enjoy the same rights and working conditions including social benefits and other privileges for work of the same nature and same degree of responsibility (see III.4).

7.3 Wages

Workers shall be paid at least the official national minimum wage currently applicable or the relevant industry standard in processing operations or the wages approved on the basis of collective bargaining, whichever is the higher. Workers shall be paid in cash, or in any other manner of their choice.

7.4 Payment in kind

If they so choose, workers may receive part of their wage in kind for services such as housing, food or others offered by the operation. The value attributed to such deductions shall be fair and reasonable. Compulsive deductions from the minimum wage for such services are not permitted.

7.5 Working hours

To permit flexibility and overtime in the peak season (e. g. harvest), an annual limit of working hours or a mutual agreement on overtime requirements in the peak period is necessary. Such an agreement has to be in line with current national labour legislation and negotiated agreements.

7.6 Social benefits

The employer ensures basic coverage for maternity, sickness and retirement. Operations with more than 10 workers need to make a policy on wages and social security available to all workers.

7.7 Further education

The unit offers its employees the possibility of further education and professional training.

¹⁴ Naturland may determine that in any one country the legal control of employment conditions and the opportunities for further education offered publicly suffices to ensure compliance with these standards.

¹⁵ Legally binding contracts (in this particular case not necessarily in writing) are required even for workers not registered. Furthermore, they have to be informed of their rights.

Part B. Regulations governing organic aquaculture

I. Principles of Management

1. Selection of site, interaction with surrounding ecosystems

- 1.1** By selection of site and the method of management of the farm, the functions of the surrounding ecosystems shall not be adversely affected. In particular, negative impact caused by effluents shall be prevented by adopting suitable risk-based measures. In order to ensure compliance with the ban on deterioration of the quality of water quality, such measures as the installation of tailings ponds or filter plants must be adopted.
- 1.2** No livestock may be permitted to escape. A description of appropriate approaches or methods designed to prevent and determine the number of escapees (date, number, reason and consequences) must be available for presentation^{Fehler! Textmarke nicht definiert.}. These measures must be stipulated in the Naturland Operator Profile and kept up to date and require Naturland's approval.
- 1.3** In the case of installation of new farms or amplification of already existing, natural vegetation shall not be damaged in a lasting way. This has to be respected, in particular, if the type of vegetation has to be classified, at regional or international level, as rare or endangered (e.g. marsh areas in Middle Europe; rain forest, mangroves).
- 1.4** 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 for fishermen and other interested parties. Recommended examples are fenced-in paths or the issue of permits. Whatever the case, the legal regulations have to be complied with. Whenever possible, active steps are to be taken at an early stage to avoid any possible conflicts with other users of the resources, by engaging in a regular and verifiable exchange of information with neighbouring communities, community representatives, organisations or other stakeholders. Should a conflict occur, records of the hearing are to be kept and Naturland informed; where possible or required, suitable measures are to be adopted.
- 1.5** Through appropriate design and management of the farm areas it shall be ensured that the water bodies inside the operation retain their ecological functions depending on the respective geographical conditions (e.g. breeding ground for amphibians and water insects, resting place for migratory birds, migration routes for fish). For this purpose, in particular, adequately large areas showing natural vegetation (e.g. water reeds, tall aquatic plants) shall be protected or newly established by the enterprise.
- 1.6** While protecting the farm areas from predatory birds and other animal species, measures not harming the animals physically shall be used (e.g. nets, dummy raptors). In exceptional cases and insofar as non-lethal methods can be proven to be ineffective, lethal methods may be used as a last resort¹⁶. All mortalities of wild animals¹⁷ resulting in connection with the control of predatory animals must be recorded.
- 1.7** Preference is to be given to the use of renewable energy resources and re-cycle materials. Waste is to be kept to a minimum. Developments in these areas have to be recorded each year.

2. Species and origin of stock

- 2.1** As stock, species naturally occurring in the region shall be used. In particular, possibility for co-operation with regional breeding/conservation programs should be examined (e.g. autochthonous strains of Atlantic salmon, Adriatic trout species). When considering traditionally established aquaculture of a certain species, species which do not occur naturally may also be kept. Proof must be submitted to Naturland that this measure causes no ecological harm (e. g. in the form of relevant scientific analyses) and the practice requires Naturland's approval. Precautions must be taken to eliminate the danger of species which do not occur naturally from escaping into or being introduced to open waters. The preventative measures (risk

¹⁶ In accordance with the IUCN (International Union for Conservation of Nature) or with local regulations, lethal measures may not be employed with respect to wild animals considered "endangered" or "critically endangered".

¹⁷ only reptiles, mammals (except for rodents) and birds

analyses, structural barriers, operative strategies and methods devised to catch and return the escaped species) are to be recorded in the Naturland Operator Profile.

- 2.2** Before stocking with new species, Naturland must be provided with detailed information (quantity, stocking densities, feed etc.) and the Naturland Operator Profile must be brought up to date.
- 2.3** The stock has to be reared on the farm itself or derive from Naturland or from farms which comply with Naturland's quality assurance requirements. Where such stock is not available (obligation to notify and provide evidence), young stock¹⁸ may be purchased from other farms for stocking purposes as per the following list of priorities:
- from aquaculture farms which are certified as per regulation (EU) 2018/848 and the subsequent legislative acts as amended or recognised in accordance by the same;
 - from conventional farms*.

The periods between procurement and sale as per Section A.I.8 are to be observed. Stocks derived from genetically manipulated (transgenic) organisms and those obtained by means of polyploidisation or gynogenesis are prohibited.

- 2.4** Feral larvae of fish and crustacean are only allowed for stocking if there is a passive inflow when the ponds or other aquaculture constructions are refilled. Mussel larvae are also allowed for stocking if they have settled on substrate which has been specially introduced for this purpose.

3. Breeding, hatchery management

- 3.1** Concerning hatchery management, the respective provisions for grow-out operations (ref. B. I.-VII.) apply correspondingly.

- 3.2** As an exception to the regulations for grow-out B. I.-VII., artificial containers (tanks, channels, etc.) including those with closed-cycle systems. Nevertheless, the husbandry conditions must take the specific needs of each species into account as far as possible (e.g. by providing hiding places), may be used in hatcheries and for the production of feed organisms.

Tempering of the water artificially, if required for breeding in hatcheries and nurseries, is also permitted. Natural well water may be used at all stages of production to temper the process water.

For rearing larvae and young fish (maximum 1/3 of the whole life cycle)¹⁹ the stocking densities in B. II.-VII. may be exceeded.

The use of ozone and ultraviolet light is only permissible in rearing and young stock stations and where no aquaculture stock is present.

- 3.3** The objective is the natural reproduction or spawn recovery. The use of hormones, even from the same species, is not allowed. If due to extreme climatic and weather conditions no natural spawn recovery can be expected, conventional measures can be resorted to following the submission of an application*. The stock obtained by such measures, is not allowed to be labelled as organic.

4. Design of holding systems, water quality, stocking density

- 4.1** The husbandry conditions must enable the animal to behave in a way natural to the species; this refers, in particular, to behavioural needs regarding movement, resting and feeding as well as social and reproduction habits. The husbandry systems shall be designed keeping all this in view. The farm should further-

¹⁸ Young stock is defined as eggs, hatchlings, fries, postlarvae and other juvenile stages.

* Currently there are differences between the EU regulation on Organic Aquaculture and the requirements on the sourcing of stocking animals or on measures for the production of spawn in the Naturland standards. This has to be taken into account if the corresponding produce are to be marketed as "organically produced" within the territory governed by the EU Organic Regulation.

¹⁹ In the case of species which undergo a smoltification process, 1/3 of the whole life cycle may be exceeded.

* Currently there are differences between the EU regulation on Organic Aquaculture and the requirements on the sourcing of stocking animals or on measures for the production of spawn in the Naturland standards. This has to be taken into account if the corresponding produce are to be marketed as "organically produced" within the territory governed by the EU Organic Regulation.

more regularly check to see whether further positive effects with regard to animal welfare can be achieved by introducing structural elements (known as environmental enrichments²⁰) to enhance the existing husbandry systems (e. g. protective shelters, type of flooring, shade etc.).

The water quality (e.g. temperature, pH, salinity, oxygen, ammonium and nitrate concentrations) must conform to the natural requirements of the species in question.

If there is sufficient evidence that artificial illumination is necessary, then the simulated day length shall not exceed 14 hours, unless longer periods are required to induce reproductive effects (e. g. to prevent cod from spawning and salmon from smoltification).

4.2 For construction and management measures only materials and substances shall be used that provably are not causing any injurious effects on the organisms or the environment.

5. Polyculture²¹

5.1 Polyculture is an approved form of farming fish and crustaceans, among other creatures. The intention when using polyculture is to make more effective use of the resources available.

5.2 As a basic principle, the animals' welfare (see art. 6 Health and Hygiene) is to be ensured for each species raised in polyculture.

5.3 Stocking several species together may in no case lead to indications of negative influences on these species. Where polyculture is practised, it is important always to observe the limits set for the stocking densities of each of the species present as well as the requirements with respect to stocking densities laid down in regulation (EU) 2018/848 and the subsequent legislative acts as amended.

6. Health and Hygiene

6.1 The farm is responsible for its animals' state of health. It is necessary to ensure that the manager (and, where applicable, other people who handle the animals, too) are trained to handle and care for them as per their individual duties, and that they have gained the necessary experience. The animals must be treated and cared for regularly, depending on the animals' needs and the requirements of the management system. Both the animals as well as the requisite plant and equipment must be inspected at regular intervals.

6.2 The health of the organisms is, primarily, to be ensured by adopting preventive measures (e.g. optimised husbandry, rearing, feeding). Natural curative methods (ref. also 6.6.) shall be preferred in case of a disease. It is permissible to vaccinate the animals as a precautionary measure. Use of conventional medicine is only permitted in vertebrates and after detailed diagnosis and remedial prescription by a veterinarian. In this case, at least twice the legally prescribed waiting period must be observed (obligation to notify and provide evidence). Use of conventional medicine is not permitted in invertebrate organisms (e.g. molluscs, crustaceans).

6.3 Routine and prophylactic treatment with chemo-synthetic drugs as well as hormones is not permitted. All regulatory and statutory regulations shall be fulfilled.

6.4 After the application of conventional substances, proof must be given of freedom from residue in the form of appropriate analysis before marketing the goods. If more than three treatments in the total life cycle or two treatments per year are applied with conventional medication or antiparasitic agents (not including vaccinations), the affected animals may not be sold with reference to Naturland. In Part B II. – VII further limitations are prescribed as necessary.

6.5 The stock shall be regularly inspected with respect to its status of health. Dead organisms shall be removed from the holding system immediately and disposed of professionally. All mortalities and their causes must be recorded. Any mass mortalities must be reported to Naturland immediately.

²⁰ The additional structural elements can be both artificial and natural.

²¹ Polyculture is the production of two or more species of the same trophic level in the same aquatic cultivation system.

6.6 Permitted treatments, also as prophylactics or routine (within the framework of statutory regulations):

- use of natural physical methods (in particular drying out, freezing out)
- use of not residue-building, inorganic compounds as per Appendix 3 of these standards
- use of naturally occurring, not residue-building organic compounds as per Appendix 3 of these standards
- use of naturally occurring vegetable substances (in particular Labiatae and Allium species); further preparations of *Azadirachta indica* (neem), oil emulsions (free of synthetic chemical insecticides) on the basis of paraffin oils, mineral oils and vegetable oils, preparations of viruses, fungi and bacteria (e. g. *Bacillus thuringensis*), pyrethrum extracts from *Chrysanthemum cinerariaefolium* (synthetic pyrethroids and synergists are prohibited) and quassia from *Quassia amara*.
- use of stone powder

The use of any substance must be approved of by Naturland, especially for the purpose of eliminating conflicts with the principles of nature conservation and animal welfare which could occur by their use²².

7. Oxygen Supply

The basis for aquaculture operation shall form the natural, physical conditions of the water body (affluent volume, current profile, temperature, water chemistry). Measures of aeration must not be used to raise the density above the permitted level. Only in exceptional situations may oxygen be used. The reason and method used must be recorded in writing.

8. Organic Fertilising

8.1 The productivity of the cultivated water bodies may be augmented by application of organic material as fertiliser in specific quantities and compositions (ref. B. Supplementary standards on specific culture systems and species).

The fertiliser used must originate, insofar as is available, from certified organic farming operations.

Where the fertilisers cannot be obtained from certified organic farming operations (obligation to notify and provide evidence) then the use of conventionally produced organic fertilisers (in the form of solid manure, hay or compost), preferably from extensive farming operations will have to be applied for with Naturland.

8.2 Such farming methods are recommended which, in a suitable way, allow aquaculture to be combined with other forms of animal husbandry (e.g. water fowl, pigs) or crop plantations (e.g. rice, water hyacinths *Eichhornia*).

9. Feeding

9.1 Purchased fodder must be certified by Naturland²³ resp. meet Naturland's quality assurance requirements. Should there be no feed available which is certified by Naturland (obligation to notify and provide evidence), Naturland may permit the purchase of organically certified feed.

9.2 All feed of vegetable and animal origins must have been produced according to the section on feed in the Naturland standards on processing.

9.3 Type, quantity and composition of feed must take into account the natural feeding methods of the concerned animal species. The activity level and the condition of the animals mainly give indications in this respect (e.g. corpulence factor, fat tissue). The proportion of animal feed components is to be replaced by vegetable products wherever nutritionally justifiable. For this reason, maximum values for the use of fish meal/oil may be determined for specific species (ref. B. Supplementary Regulations for specific farming systems and animal species)²⁴.

²² The measures taken and materials used must be recorded in the Naturland Operator Profile or in a separate document and submitted to Naturland for approval at least once a year.

²³ The section on feed of the Naturland standards on processing applies.

²⁴ The maximum values of the total protein content and the proportion of fish meal or fish oil may only be exceeded in the feed for young stock or parent animal feed and only upon approval by Naturland.

9.4 Special requirements are made as to the origin of fish meal/oil (ref. Appendix 1).

9.5 Feed additives (technological, sensory, nutritional and zootechnical additives) must meet the requirements of the section on feed in the Naturland standards for processing.

9.6 Feed containing genetically modified organisms or products made thereof is prohibited.

9.7 The economic feed conversion ratio (eFCR) must be calculated and recorded in writing every year for every harvest cycle terminating within a calendar year. Naturland must be informed when any extraordinary deviations in the feed conversion ratios (critical value: 25% variance from the figure for the previous year) occur²⁵.

9.8 For certain farming systems, an upper limit for the quantities of feed introduced may be determined (ref. B. Supplementary Regulations for specific farming systems and animal species).

10. Transport, slaughtering and processing

Catching, transport and slaughtering must be done quickly and humanely in order to spare the animals unnecessary suffering. The method of proceeding and the materials used have in any case to be oriented towards the needs of the respective species (e.g. sensitivity to higher temperature or to stress). The equipment used (e. g. landing nets, tanks, chutes) must be free of any risk of injury (e. g. because of rough surfaces).

10.1 Live fish must be supplied with enough oxygen during transport and when kept in cages. A transport density of 1 kg of fish per 8 litres of water may not be exceeded. The water must be changed at the latest after 6 hours of transport and must be of the same temperature. The transport duration is maximum 10 hrs.²⁶

10.2 Slaughtering of fishes shall be carried out by means of incision of gills or immediate evisceration. Prior to this, fishes have to be stunned (by means of concussion, electrocution and, if need be, by natural plant anaesthetics, tropical and subtropical fish and invertebrates also by using ice, provided that it is not otherwise specified for certain species in the Special Part).

10.3 Maintenance of the cold chain from the point of slaughtering up to the sales point must be strictly observed, in order to prevent any deterioration in the product quality.

In the case of processed products, only products and additives in accordance with Naturland standards shall be used. General Processing Standards of Naturland shall be complied with.

10.4 The cleaning of factory rooms, devices and machines must ensure a perfect hygiene along with an as high as possible ecofriendliness. Mechano-physical processes shall be preferred to chemical processes. Regarding the cleaning and disinfection agents used, a separate book of records shall be kept. These must also be recorded in the Naturland Operator Profile.

The wastewater from the slaughtering and processing plants must be subjected to appropriate purification process.

11. Documentation

11.1 The farm is required to complete the Naturland Operator Profile²⁷ to record its specific implementation of the 'Principles of organic management (B.I.)'. This profile must be submitted before the farm is certified for the first time and is to be brought up to date annually and approved by Naturland. All means of pro-

²⁵ The eFCR is calculated as follows: $eFCR = \text{annual consumption of feed/net biomass (live weight) of the organisms produced}$. The net biomass is calculated as follows: $\text{net biomass} = \text{aggregate live weight of the organisms harvested} - \text{aggregate weight of the livestock}$. This requirement does not apply to extensive systems requiring no supplementary feed.

²⁶ If the transport takes place in a "wellboat" especially constructed for the transport of fish, the transport duration can be extended to maximum 72 hrs.

²⁷ Naturland can provide a template for the Naturland Operator Profile upon request.

duction must be recorded in the Naturland Operator Profile. Where this is not possible, a separate list of means of production must be kept and approved regularly by Naturland.

11.2 Any possible affect on the surrounding eco-system must, among other things, be recorded in an environmental impact assessment report²⁸ for Naturland's approval.

11.3 A reporting protocol which provides details of procedures in connection with harvesting, sorting, caging, stunning and killing²⁹ is to be presented before the farm is certified for the first time and agreed upon with Naturland, and is to be kept up to date as required.

11.4 The farm produces a sustainability plan which covers the measures implemented under B.I.1.5. and the requirements with respect to environmental protection and nature conservation as described under B.I-IX. In addition, the other farms in the vicinity (e. g. those situated upstream or downstream and farms in the same bay) are to be recorded (type of farm, type of management, co-operation etc.), insofar as they could make an impact on the Naturland farm and/or on the eco-system.

12. Smoking

Customary smoking techniques are permitted. Smoke from untreated and native wood and branches, and, where applicable, spices as well as smoke from purified primary smoke condensate from untreated and, where available, native wood and branches may be used. The glowing temperature shall not exceed, on an average, 500°C (max. 650°C). The smoke conduction shall be such that a cooling of the smoke takes place, and any entry of substances (fat, protein, drip fluid) from the material to be smoked into the glowing zone is avoided.

“Black smoking”, the use of so-called “Katenrauch”³⁰, the use of chemically treated types, resin-rich or toxic wood and liquid smoke preparations as well as the technique of salting by injection are prohibited.

²⁸ ref. also “Supplementary regulations for the culture”. Naturland can provide a template.

²⁹ Guidelines for the reporting protocol for fish kills may be ordered from Naturland.

³⁰ „Katenrauch“: smoking process using smoke from the household fireplace with the product to be smoked hanging from the roof

II. Supplementary regulations for the culture of carp (*Cyprinus carpio* among others) in ponds

1. Close-to-nature design of the ponds

On average, at least 30% of embankment line shall represent the natural biotope structure to at least 2 m depth in the form of a helophytic zone, reed and/or overhanging trees/shrubs.

2. Construction of ponds, quality of water

2.1 The inflowing water shall reveal none or only slight contamination of anthropogenic origin. The pH-value shall be between pH 6.0 and 9.0.

It is explicitly recommended to conclude an agreement with the immediate neighbours employing conventional farming methods (also paying attention to inflowing water) to establish a management plan of the boundaries compatible to organic farming. Impact on the environment and the bodies of water being used are to be monitored regularly³¹.

2.2 The culture of fishes in artificial containers (polyester, concrete etc.) is not permitted. Only for the short term stay of spawners and their hatchlings for breeding purposes and the post-harvest maintenance of fishes (up to a maximum of 8 weeks) are such containers permitted.

2.3 Preventive measures must be adopted and structures created to prevent the animals escaping (e. g. structural barriers, operative measures). The embankments built round the ponds must be sufficiently high and sturdy. Any discharge into natural systems must show proof of a suitable mesh and/or barriers. The measures must be checked regularly and the structures maintained in good order.

3. Stocking density and feed

3.1 The stocking density shall not exceed the state, that at least a 50% of fish yield is attained via the natural feed availability. Only in the case that protein-rich feed (e.g. peas and beans) is administered, the maximum yield permitted is 1,200 kg carp per hectare of pond area per year.

3.2 Where carp and other species (e. g. pike, pike-perch, tench) are reared in polyculture, the total maximum yield of 1,500 kg per hectare per year applies.

3.3 Fish meal and fish oil is not permitted in the feed.

4. Health and Hygiene

The ponds shall be re-filled at latest by March/April (mid-Europe). Breeding ponds may also be re-filled later in the year.

If hygienic measures (e.g. for controlling leeches) are necessary, then quick lime (CaO) and hydrated lime (Ca(OH)₂) are permitted to be applied on to the humid pond bottom (max. 200 kg/ha per year). Its application into the pond (max. 150 kg/ha per year) for the purposes of pH-stabilisation and for precipitating of suspended organic matter is permitted in critical weather situations. *

5. Organic Fertilising

Organic fertiliser may be applied to the pond to the extent of max. 0.25 DE/ha (20 kg N/ha). Numbers of water-fowl cultured on the fishponds shall be appropriately taken into this calculation.

6. Transport, slaughtering

As maximum transport density: C3: 1 kg/2 l, C2: 1 kg/3 l, C1: 1 kg/4 l are set.

³¹ The frequencies and parameters recorded in the environmental impact assessment report apply.

* Currently there are differences between the EU regulation on Organic Aquaculture and the requirements in the Naturland standards. This has to be taken into account if the corresponding produce are to be marketed as "organically produced" within the territory governed by the EU Organic Regulation.

It is recommended that carp be stunned using a combination of electrical stunning followed by a blow to the head.

III. Supplementary regulations for the culture of Salmonidae (e.g. trout *Salmo trutta*, *Oncorhynchus* sp., salmon *Salmo salar*, charr *Salvelinus* sp., whitefish *Coregonus* sp.) in ponds, flow-through systems and net cages

1. Site selection

Where fish are kept in marine net cages, the status of the water must be "very good" or "good"³². In the case of ponds and flow-through systems, the inlet water must exhibit at least water quality II³³.

2. Prevention of water pollution, natural design of the ponds

2.1 The water quality³⁴ of source water bodies (in the case of pond farms and flow-through systems) or the surrounding lake or sea regions (in the case of net cages) shall not become deteriorated to a significant extent due to the farming operation. In the case of pond farms and flow-through systems, this shall be secured by sedimentation ponds and/or filtering plants dimensioned adequately. Settled particulate organic matter (products of metabolism, feed residues) shall be removed and brought to adequate re-usage (e.g. as fertiliser in agriculture).

2.2 In the case of pond and flow-through systems, the effects on the environment and the bodies of water in use are to be monitored by performing regular analyses. At least one inspection must be performed during the highest/maximum fish biomass of the current calendar year. The measurements of the individual chemical and physical parameters must be performed at the point of discharge and a reference value taken upstream of the inflow³⁵.

2.3 In the case of net cages in the sea, the sea bed is to be inspected regularly (benchmark: once every production cycle) for signs of pollution. The benthic analyses must be performed at least in the immediate vicinity of the net cages and beyond the area surrounding the net cages. If the farm does not fall within the domain of the European Water Framework Directive (EU FWD) or if Naturland has made an extra demand that they be performed, regular analyses of the water quality are to be made³⁶.

2.4 The release of nutrients by the farm shall be kept as low as possible. The feed conversion ratio must be determined and compared with values given in literature and, if necessary, appropriate measures taken.

2.5 If water is tapped for a pond farm or flow-through system from a stream, then at least 50% of the average low water level shall remain in the source stream bed.

If there are dams constructed in the farm area, they shall be passable for migrating fishes. New constructions shall take this requirement into account.

2.6 In pond farms and flow-through systems, on at least 10% of the interconnected area farmed, the natural vegetation shall be allowed to develop undisturbed (as a refuge for native animal species).

2.7 Inlet and outlet of the farm shall be protected from invasion by wild fishes as well as from stock escaping. Net cages shall be secured by means of firm anchoring, strong net walls and a type of construction taking into account the prevailing conditions against damage and related escaping of stocks.

2.8 The grow-out of fish in artificial tanks (e.g. glass-fibre, polyester) with a closed water cycle is not permitted. The grow-out in ponds and flow-through systems with concrete walls is only permitted if the bottom is made out of natural substrate, or covered entirely with gravel. The biological functions of the bottom and

³² Classification according to the European Water Framework Directive (WFD). Beyond the territory of application of the EU-WFD, equivalent national programmes or baseline analyses presented by the farm can be accepted.

³³ Classification of classical water quality on the basis of the saprobic system. Equivalent national programmes or baseline assessment submitted by the farm can be accepted.

³⁴ Classification according to the European Water Framework Directive (WFD). Beyond the territory of application of the EU-WFD, equivalent national programmes or baseline analyses presented by the farm can be accepted.

³⁵ The parameters and frequencies recorded in the environmental impact assessment report apply.

³⁶ The parameters and frequencies recorded in the environmental impact assessment report apply.

Part B; III. Supplementary regulations for the culture of Salmonidae (e.g. trout *Salmo trutta*, *Oncorhynchus* sp., salmon *Salmo salar*, charr *Salvelinus* sp., whitefish *Coregonus* sp.) in ponds, flow-through systems and net cages

the walls should be encouraged. If need be re-building measures are to be defined in the conversion plan. Culture in artificial tanks with closed water cycles is permitted only for limited periods in juvenile stages (e.g. egg to fingerling or smolt).

3. Stocking density

Stocking density of salmon (*Salmo salar*) shall not exceed 10 kg fish/m³. The maximum stocking density of brook trout (*Salvelinus fontinalis*) and whitefish (*Coregonus*) is 15 kg/m³.

The maximum stocking density of trout (*Oncorhynchus*, *Trutta*) and arctic charr (*Salvelinus alpinus*) is 20 kg/m³. Where salmonids are kept in net cages, the maximum stocking density is 10 kg/m³.

In no case shall the animals display any injuries (e.g. to their fins) indicating too high stocking densities.

4. Health and hygiene

4.1 A health maintenance contract should be concluded with a professional veterinary institution (e.g. veterinary health service).

4.2 The intensity of infection with sea lice of the genus *Lepeophtheirus* and/or *Caligus* must be regularly determined by the farm itself and documented³⁷.

4.3 During sensitive periods³⁸ samples must be taken more frequently (benchmark: at least once every 14 days)³⁹. A plan of action must be produced which describes, among other things, how the intensity of the infestation is reduced before sensitive periods. Wherever possible this must be agreed upon with local organisations and/or legislative bodies.

4.4 Naturland must be informed within 14 days whenever national standards on infestation limits are exceeded in repeated samples.

4.5 For controlling parasites (e.g. sea lice) in marine net cages "cleaner fishes" may be used⁴⁰.

4.6 For the protection of net cages against growth of algae and colonisation by invertebrates, environment-friendly methods shall be employed. Use of chemical "anti-fouling" agents is prohibited.

4.7 Exceptions to the limitation imposed under B.I.6.2 are made for national regulations governing the treatment of salmon lice.

4.8 Should large numbers of stock escape from the cages or systems as a result of extreme environmental incidents (storms, floods, etc.) or human error, this must be reported to Naturland immediately. It must be determined what allowed the stock to escape and corresponding remedial measures to avoid this happening in the future must be adopted. When such incidents occur, the farm must co-operate with national authorities, NGOs and other bodies in efforts to limit the risk of any repetition and reduce risk to the environment.

4.9 To safeguard the animal welfare, the fish must not be starved for more than 50 day degrees⁴¹ (before such measures as harvesting or transport).

³⁷ The intensity of the infestation must only be determined for the species which is relevant in the field of application.

³⁸ For example for migratory wild salmonids. The migration period must be determined by independent experts or national specifications.

³⁹ Under particular circumstances, sampling may be suspended for a short period in the interests of animal welfare. The reasons for this must be recorded in writing and Naturland must be informed promptly.

⁴⁰ Before cleaner fish are used, it is necessary to ensure that the national regulations and Naturland's requirements as per Appendix 4 are complied with.

⁴¹ Day degree is defined as the water temperature (°C) multiplied by the number of days (total day degrees = water temperature x number of days).

5. Feeding

Histidine⁴² produced by natural fermentation is permissible as an ingredient of the feed ration of salmonids in cases where an insufficient quantity of histidine cannot be guaranteed in the other types of feed allowed (ref. B.I.9) in order to fulfil the physiological nutrient requirements of the fish and to prevent the formation of cataracts (clouding of the lens).

⁴² The section on feed in the Naturland processing standards applies.

IV. Supplementary regulations for the marine culture of mussels (e.g. *Mytilus edulis*) on ropes and frames

1. Site selection, interactions with the surrounding ecosystems

1.1 Mussels have to be regarded as indicator organisms. Therefore, their microbiological and chemical status reflects water quality.

Water quality shall be class A⁴³. Water quality shall be determined at least monthly by an independent institution. Results have to be documented continually

1.2 The mussel cultivation must be subjected to maximum possible turnover of water from the open sea. Mussel culture in immediate proximity to shore or close to nutrient-rich inflows is not permitted.

1.3 Mussel cultures managed according to these standards form an important habitat for plants, invertebrates and fishes. All management measures esp. during harvest shall be directed towards protecting and supporting this special habitat.

2. Type and origin of stock

2.1 If seeds are collected from wild stocks, care shall be taken that collecting activities will not cause lasting damage to the ecosystem.

- The collecting area shall be identifiable. Therefore, it has to be clearly identified by maps, site plans etc.
- Collecting activities shall be documented and traceable to the respective collecting area (time of collection, quantity of seed collected, name of the collector(s) etc.).
- Collection shall not exceed the sustainable quantity in a given area.

2.2 Mussel larvae are allowed for stocking if they have settled on substrate which has been especially introduced for this purpose.

3. Culture systems

3.1 To assure that while lifting the culture units for control purposes or for harvesting no damage is done to the sea bottom settling fauna and flora, the mussels shall be cultured in/on nets or ropes that are anchored firmly on the sea bottom and kept in a vertical position by floats.

Therefore, it is not allowed to cultivate mussels loose on the sea bottom and to harvest them by dredging.

3.2 For mussel cultivation on rafts, the number of drop-ropes shall not exceed one per square metre of surface area. The ropes may be no longer than 20 metres. Thinning-out of drop ropes shall not take place during the production cycle. Sub-division of drop-ropes is permitted if the stocking density is not increased.

3.3 Ropes, rafts and mesh tubes shall be appropriate for reuse as far as possible. After use they shall be decomposed or recycled.

4. Processing

For treatment of water for depuration/purification purposes only mechanical means (filters) and/or UV light is allowed.

Use of chemicals (e.g. chlorine compounds) is prohibited.

Wastewater from processing plants shall be cleaned by adequate measures.

⁴³ The number of faec. *Escherichia coli* in mussel tissue and shell fluid is regarded as a valid measure for water quality in marine mussel culture (Class A: $\leq 2,3$ faec. *E.coli* counts/g tissue).

V. Supplementary regulations for the pond culture of crustaceans (shrimps *Litopenaeus vannamei*, *Penaeus monodon*, *Macrobrachium rosenbergii* and crayfish *Astacus astacus*, among others)

1. Site selection, protection of mangroves

1.1 Mangrove plant communities have to be protected. Mangroves are considered as extremely important ecosystems that, at the same time, are endangered world-wide by human activities. Therefore, it is not permitted to remove or damage mangrove forest for purposes of construction or expansion of shrimp farms.

Any measure carried out by the farm or on the farm's demand likely to influence adjacent mangrove forest (e.g. construction of pathways and channels to the farm area) shall be announced to and approved by Naturland.

1.2 Farms (here: independent, coherent production units), which in parts have been established in former mangrove area, may only be converted to organic aquaculture according to Naturland standards if they were established prior to 1.1.1995 (or possibly an earlier date depending on legislation) and the former mangrove area is less than 50% of total farm area.

The former mangrove area of the farm area shall be reforested to at least 50% with mangroves during a period of maximum 5 years upon conclusion of the producer contract. The reforestation is part of the conversion plan, and the progress made in the measures undertaken is checked annually by Naturland. The harvest of the area in question is not permitted to be labelled and marketed as an organic product according to Naturland standards, until Naturland has confirmed the successful completion of reforestation. Exceptions to these rules may be granted in the light of particular geographic or historical conditions for extensive mangrove aquaculture systems. A pre-condition for certification is in any case that the applicable legal regulations governing land use, reforestation etc. were also complied with in the past.

2. Protection of ecosystems – farm area and surrounding

2.1 The water quality of source water shall not become significantly deteriorated (standard value <10% of the parameters determined, see footnote) due to the farming operation. This shall be secured by sedimentation ponds and/or filtering plants dimensioned adequately. Settled particulate organic matter (products of metabolism, feed residues) shall be removed and brought to adequate re-usage (e.g. as fertiliser in agriculture). The effects on surrounding ecosystems have to be monitored and documented on an at least monthly base by the farm⁴⁴.

2.2 Adequate measures must be taken to minimise the outflow of nutrients and/or suspended solids, especially during harvesting. Organic sediments shall be removed on a regular base from the channels and brought to appropriate utilisation (e.g. as fertiliser in agricultural units).

2.3 Adjacent agricultural areas shall be influenced negatively neither by saline water filtering from the ponds nor by scattered salt dust.

If there are indications for adverse effects (e.g. yellowing of plants on the borders) adequate preventive measures (e.g. construction of drainage channels, plantation of salt-resistant, high-growing grasses, e.g. *Setifer zizanioides*) must be taken.

2.4 In order to stabilise/enhance the ecological system and the natural dynamics on the farm area, at least 50% of total dyke surface shall be covered by plants. This state shall be reached during a period of maximum 3 years.

Recommended plant species for tropical regions are e.g. leguminosae trees (e.g. *Algorrobo*), aloe and others for the tops of the dykes, mangrove species, semi-aquatic herbs and floating grasses for the lower parts of the slopes.

⁴⁴ The measurement of single parameters (e.g. ammonia, nitrate, nitrite, phosphorus, suspended particles, BSB5, oxygen saturation) at the outlet, compared with values from reference points above the effluent. In the case of extensive farms which do not provide supplementary feed and of *Astacus astacus*, the measurements may be taken at greater intervals and in other places upon approval by Naturland.

Farms situated in areas originally free from vegetation (e.g. dunes, desert) are excluded from this requirement.

2.5 In order to find an ecologically adequate and economically effective management against predatory birds, documentation on foraging predators, estimated harvest losses and type of preventive measures shall be kept.

It is recommended to raise ducks in the ponds, expelling intruding birds from their breeding territories. Native animals (e.g. ant-eaters, iguanas, wild cats, migrating water birds) shall be protected as indicators for an intact environment.

2.6 Unwanted fish in the ponds shall only be regulated by mechanical means (e.g. seining) or by application of natural, herbal ichtyocides (e.g. saponine).

The use of synthesised herbicides and pesticides (with the exception of substances listed in I. 6.2) on the farm area is not allowed.

2.7 Release of toxic or otherwise harmful substances in the ponds, the channels or the banks shall be prevented. This applies especially to installation and management of pumping stations (e.g. oil spoilage), harvesting technique as well as the overall hygienic conditions on the farm.

2.8 Preventative measures must be adopted, and systems put in place to prevent the stock escaping (e.g. structural barriers, operative measures). The embankments must be high and stable enough to prevent the stock escaping even during a flood. Outflows into natural systems must be equipped with a suitable mesh and/or barriers. The measures must be inspected regularly, and the systems properly maintained.

2.9 Should large numbers of stock escape from the cages or systems as a result of extreme environmental incidents (storms, floods, etc.) or human error, this must be reported to Naturland immediately. It must be determined what allowed the stock to escape and corresponding remedial measures to avoid this happening in the future must be adopted. When such incidents occur, the farm must co-operate with national authorities, NGOs and other bodies in efforts to minimise the risk of any repetition of the incident.

3. Origin of stock

3.1 Collecting wild larvae is prohibited. It is the declared objective to become fully independent from collecting wild post-larvae or brood stock, and to use only stocks obtained through reproduction in captivity ("closed cycle").

3.2 The manipulation of eyestalks (ligation, ablation, or similar measures), and the use of larvae which have been produced using this method, are prohibited.

4. Breeding, hatchery management

4.1 Also in hatchery management, the use of antibiotics, chemotherapeutics and comparable substances is prohibited.

4.2 Alimentation of parent stock and larvae as well as culture of feed organisms (algae, *Artemia salina*, rotifers) in the hatcheries should be carried out according to the principles of organic agriculture. Administration of untreated seafood (e.g. fish, worms, mussels) as a protein supplement for parent stock is permitted. Measures that enrich the larval environment (e.g. by providing special substrates) and increase the productivity of the rearing tanks/nursery ponds (culture of feed organisms) are recommended.

4.3 Also within culture of brood stock and larvae as well as feed organisms in artificial tanks with a closed water cycle in the hatchery, technical measures for aeration, artificial lighting and heating shall be decreased as much as possible.

5. Pond design, water quality, stocking density

Part B; V. Supplementary regulations for the pond culture of crustaceans (shrimps *Litopenaeus vannamei*, *Penaeus monodon*, *Macrobrachium rosenbergii* and crayfish *Astacus astacus*, among others)

5.1 Efforts shall be made to support the natural foraging behaviour of decapods (Decapoda) by an adequate pond design.

5.2 In order to decrease energy consumption as well as nutrient losses by the farm, efforts shall be made towards the lowest possible water exchange rate.

Pumping periods in marine and estuary areas shall be limited to high tide, and unnecessarily protruding (in altitude) pipes shall be avoided, both in order to minimise energy consumption.

5.3 As provisional maximum for stocking density of decapods (Decapoda)⁴⁵ shall be set 15 post larvae/m². The biomass in the ponds shall not exceed 1600 kg/ha.

5.4 The following maximum stocking densities apply to the cultivation of noble crayfish (*Astacus astacus*):

a. small crayfish (< 20 mm): 100/m²

b. medium-sized crayfish (20 - 50 mm): 30/m²

c. adult crayfish (> 50 mm): 5/m²

5.5 Ponds used for the production of astacidea (*Astacidea*) must provide sufficient places of safe retreat and protected areas, whether natural or artificial.

6. Health and hygiene

6.1 Particular stress shall be laid on preventive measures (e.g. controlled origin of larvae, monitoring of water quality and ecological conditions in the ponds).

Application/culture of (non-genetically modified) probiotic microorganisms in the ponds is permitted.

6.2 Health status of animals shall be monitored and documented on a regular basis.

Special efforts shall be made to detect correlation between management measures, manifestation of viral diseases, reasons for mortalities, individual growth and yields/biomass development.

6.3 Treatment with antibiotics, chemo-therapeutics and comparable substances in the ponds is not permitted.

6.4 After harvest, the pond bottom shall be given enough time to dry. Waterfowl shall be allowed to forage on the drying bottom for remaining fish and invertebrates.

Additional measures (e.g. ploughing, intermediate cultures such as *Salicornia*) shall be considered after several production cycles for recovery of the pond bottom.

7. Fertilising of ponds

Supplementary doses of phosphate (as raw phosphate from natural sources) are permitted.

The overall quantity of fertilisers shall be limited in first order by the effluent water quality.

8. Feeding

8.1 Efforts shall be made towards reducing the total doses of external feed, respectively, towards increasing the importance of natural feed production (phyto-, zooplankton) in the ponds. Therefore, careful documentation shall be kept by the farm operator, allowing to calculate the eFCR⁴⁶.

Additionally, the fishmeal content as well as the total protein content of compound feed shall be reduced as far as possible in the case of decapods (Decapoda)⁴⁷. As provisional maximum levels shall be set: 20% for fishmeal/-oil content and 30% for total protein.

8.2 Feed intake shall be monitored and documented carefully in order to avoid accumulation of organic sediments by an excess of feed.

⁴⁵ with the exception of astacidea (*Astacidea*)

⁴⁶ Extensive rearing systems without supplementary feeding are excluded from the requirement for records.

⁴⁷ with the exception of astacidea (*Astacidea*)

9. Harvesting and processing

9.1 Feeding and fertilising shall be ceased for an adequate period before harvesting. As minimum are set 3 days.

Drainage of ponds shall be carried out as carefully/slowly as possible in order not to release uncontrolled quantities of organic sediment into the channels. Alternatively, a barrier in the channel draining the pond shall be used to retain the sludge.

The status of pond sediments (type, quantity) shall be analysed and documented carefully after harvesting in order to optimise management measures accordingly.

9.2 The use of metabisulfite during harvest procedure or for processing is prohibited.

9.3 Shrimp heads and other processing residues/trimmings shall be brought towards an adequate re-use.

Direct feeding of untreated processing residues to the same species is not permitted due to hygienic reasons.

VI. Supplementary regulations for the culture of tropical freshwater fishes (e.g. milkfish *Chanos chanos*, tilapia *Oreochromis sp.*, Siamese catfish *Pangasius sp.*) in ponds, flow-through systems and net cages

1. Site selection

Where the fish are cultivated in ponds, the inflowing water must be at least of grade II quality⁴⁸.

2. Water pollution control, natural design of ponds

2.1 The water quality⁴⁹ of source water shall not become significantly deteriorated due to the farming operation. In the case of pond and flow-through systems, this shall be secured by sedimentation ponds and/or filtering plants dimensioned adequately. Settled particulate organic matter (products of metabolism, feed residues) shall be removed and brought to adequate re-usage (e.g. as fertiliser in agriculture).

2.2 The impact on the environment and the water bodies in use must be monitored by means of regular analyses. At least one analysis must be performed during the greatest/maximum fish biomass in the current calendar year. The measurements taken of the individual chemical and physical parameters must be taken in the vicinity of the discharge and as a benchmark above the inflow⁵⁰.

2.3 The bottom below net cages shall also be regularly inspected for adverse effects (e.g. organic deposits caused by excrements and feed residues)⁵¹.

2.4 The release of nutrients by the farm shall be kept as low as possible. Therefore, it is recommended to determine the feed conversion ratio and to compare it with values given in literature. Insufficient feed conversion is an indicator for increased nutrient discharge and can give indications about inadequate feeding regimes (e.g. quantity, feeding schedule).

2.5 If water is tapped for a pond or flow-through system from a stream, then at least 25% of the average low water level shall remain in the source stream bed.

If there are dams constructed in the farm area, they shall be passable for migrating fishes. New constructions shall take this requirement into account.

2.6 In pond and flow-through systems, on at least 10% of production area, the natural vegetation shall be allowed to develop undisturbed (as a refuge for native animal species).

2.7 Inlet and outlet of the farm shall be protected from invasion by wild fishes as well as from stock escaping. Net cages shall be secured by means of firm anchoring, strong net walls and a type of construction taking into account the prevailing conditions against damage and related escaping of stocks.

2.8 The grow-out of fish in artificial tanks (e.g. glass-fibre, polyester) with a closed water circuit is not permitted. The grow-out in pond or flow-through systems with concrete walls is only permitted if the bottom of the pond is made out of natural substrate or covered with gravel. The biological functions of the bottom and the walls must be ensured. If need be re-building measures are to be defined in the conversion plan.

Culture in artificial tanks in closed systems is permitted only for limited periods in juvenile stages (e.g. egg to fingerling or smolt). For the purpose of conditioning for transport or slaughtering it is permitted to keep the fish in artificial tanks for two weeks maximum. The maximum density allowed during conditioning is the same as for the transport of the relevant species. Feeding during the conditioning period is not permitted.

⁴⁸ Classification of classical water quality on the basis of the saprobic system. Equivalent national programmes or baseline assessment submitted by the farm can be accepted.

⁴⁹ Classification according to the European Water Framework Directive (WFD). Beyond the territory of application of the EU-WFD, equivalent national programmes or baseline analyses presented by the farm can be accepted.

⁵⁰ The parameters and frequencies recorded in the environmental impact assessment report apply.

⁵¹ The parameters and frequency recorded in the analysis protocol (e. g. monitoring of the benthic zone, sediment profile images) apply.

3. Special provisions for the design of pond and flow-through systems for tilapia

3.1 The natural feeding behaviour of the tilapia which typically feed on plankton or periphyton should be promoted by suitable management (fertilisation, water exchange) or a special system design (e.g. by implementing or increasing structures or substrates which raise the growth surface for benthic algae/diatoms).

3.2 To minimise the energy consumption as well as the nutrient loss of the pond farm, a low water exchange rate should be aimed at.

Data for the energy consumption related to the pond surface must be collected by the operator carefully. These values have to be documented during farm inspection.

4. Stocking density

The stocking density may not exceed 10 kg/m³, this being the upper limit. The only exception to this rule is in the cultivation of tilapia (*Oreochromis sp.*) where a stocking density of 20 kg/m³ is permissible.

In no case may the fish show evidence of injuries (e.g. to their fins) which would indicate excessive stocking density.

5. Breeding, hatchery management

The feeding of parent stock and larvae and the cultivation of feed organisms (algae, *Artemia salina*, rotifers) in the breeding plants should follow the principles of organic aquaculture. It is permissible to feed untreated marine creatures (e.g. fish, worms, shellfish) to supplement the protein intake of the parent stocks.

6. Health and hygiene

6.1 For the protection of net cages against growth of algae and colonisation by invertebrates, environment-friendly methods shall be employed. Use of chemical "anti-fouling" agents is prohibited.

6.2 At pond farms the pond bottom should be able to dry up after the harvest. Water birds should be allowed access to the pond surface to feed on the remaining fish and invertebrates. It is recommended to carry out additional measures (e.g. ploughing, intercultures of legumes) after several production cycles.

6.3 For disinfection the pond bottom can be limed. Nevertheless, the maximum amount of lime applied to the pond may not exceed 1000 kg/ha. In addition, the liming can have a positive effect on the productivity of the ponds.

7. Feed

7.1 The upper limit for the fish meal resp. fish oil content in feed has been determined at 10% for *Pangasius*.

7.2 It is not permissible to include fish meal or fish oil in the feed of *Oreochromis*.

VII. Supplementary regulations for the culture of *Perciformes* (perch-like), *Carangiformes* (jack-like) and *Gadiformes* (cod-like) fish species in marine net cages

1. Site selection

When cultivating fish in marine net cages, the water quality must be either "very good" or "good"⁵².

2. Prevention of water pollution

2.1 The water quality of source water bodies or the surrounding sea regions shall not become significantly deteriorated (standard value < 10% of the parameters determined, see footnote) due to the farming operation.

2.2 In the case of marine net cages, the sea bed must be examined regularly (benchmark: once per production cycle) for adverse effects. The benthic analyses must be made at least in the immediate vicinity of the net cages and outside the waters surrounding the net cages.
If the farm does not fall within the domain of the European Water Framework Directive (EU WFD), or if Naturland should make an additional demand to do so, then regular analyses of the water quality have to be made⁵³.

2.3 The outflow of nutrients from the farm shall be kept as low as possible. The feed conversion ratio must be determined and compared with values given in literature and, if necessary, appropriate measures taken.
Net cages shall be secured by means of firm anchoring, strong net walls and a type of construction taking into account the prevailing conditions against damage and related escaping of stocks.

2.4 The grow-out of fish in artificial tanks (e.g. glass-fibre, polyester) with a closed water cycle is not permitted. Culture in artificial tanks with a closed water cycle is permitted only for limited periods in juvenile stages (e.g. egg to fingerling or smolt).

3. Stocking density

In the case of members of the species *Perciformes*, *Carangiformes* and *Gadiformes*, the stocking density shall not exceed 10 kg fish/m³.

In no case shall the animals display any injuries (e.g. of the fins) indicating too high stocking densities.

4. Health and hygiene

4.1 It is recommended to conclude a health maintenance contract with a professional veterinary institution (e.g. veterinary health service).

4.2 For controlling parasites (e.g. salmon lice) in net cages "cleaner fishes" can be used⁵⁴.

4.3 For the protection of net cages against growth of algae and colonisation by invertebrates, environment-friendly methods shall be employed. Use of chemical "anti-fouling" agents is prohibited.

4.4 Should large numbers of stock escape from the cages or systems as a result of extreme environmental incidents (storms, floods, etc.) or human error, this must be reported to Naturland immediately. It must be determined what allowed the stock to escape and corresponding remedial measures to avoid this happening in the future must be adopted. The farm must co-operate with national authorities, NGOs and other bodies in efforts to limit the risk of any repetition and reduce risk to the environment.

⁵² Classification according to the European Water Framework Directive (WFD). Beyond the territory of application of the EU-WFD, equivalent national programmes or baseline analyses presented by the farm can be accepted.

⁵³ The parameters and frequencies recorded in the environmental impact assessment report apply.

⁵⁴ Before cleaner fish are used, it is necessary to ensure that the national regulations and Naturland's requirements as per Appendix 4 are complied with.

VIII. Supplementary regulations for the cultivation and collection of marine macroalgae (*Chlorophyceae*, *Phaeophyceae*, *Rhodophyceae*)

1. Selection of site, interaction with surrounding ecosystems

- 1.1 Seaweed beds form an important habitat for invertebrates and fishes. All management measures esp. during harvest shall be directed towards protecting and supporting this special habitat.
- 1.2 Algae in accordance with these standards shall grow only in locations that are not subject to any radioactive, chemical or bacteriological contamination or to any pollutants that would compromise the organic nature of the products. Potential contamination sources may include nuclear power plants, sewage discharge, waste disposals, important harbours, coastal industry and intensive agriculture in the zone of influence, conventional aquaculture sites, etc.
- 1.3 Macroalgae can be regarded as indicator organisms. Therefore, their microbiological and chemical status reflects water quality. The growing areas have to be in very good ecological condition as defined by the Water Framework Directive (WFD) 2000/60/EC of the European Parliament or of comparable quality⁵⁵. In regions, where WFD 2000/60 is not implemented, the scope of water quality monitoring has to be equivalent to that laid down in WFD 2000/60. This equivalency has to be approved by Naturland.
- 1.4 All operations are required to provide a detailed sustainable management plan, based on an environmental assessment. This plan shall in particular identify and evaluate the impacts of the once-off biomass on target and non-target species as well as on local macroalgae biodiversity. The biology and life cycles of the main seaweeds harvested have to be considered. The plan has to list potential environmental effects of the operation and provide a list of measures to be taken to minimise negative impacts on the surrounding aquatic and terrestrial environments. It has to be approved by Naturland.

2. Cultivation

- 2.1 If plantlets are collected from wild stocks, the regulations under article 3 apply: "Collection of wild seaweed"
- 2.2 Fertilising is only allowed in tank based facilities. Fertilisers used have to comply with the requirements in the "Regulations governing organic aquaculture", part B.I.8 Chemo-synthetic fertilisers and fertilisers of animal origin are not allowed. Mineral nutrients and trace elements have to be from naturally occurring sources with known composition (e. g. stone meal). In tank based facilities where such external nutrient sources are used, the nutrient level in the effluent water shall be at most the same than the inflowing water.
The use of antibiotics and other chemo-synthetic substances is prohibited.
- 2.3 For the protection of ropes and other equipment used for growing seaweed against growth of algae and colonisation by invertebrates, environment-friendly methods shall be employed. Use of chemical "anti-fouling" agents is prohibited.
- 2.4 Culture density (growth of biomass for harvest estimation) of the algae culture shall be recorded.
- 2.5 Nets, ropes, floats, poles (no depletion of forest stands, destruction of mangroves) etc. used for growing seaweed shall be appropriate for reuse as far as possible. After use they shall be decomposed or recycled. In any case, they shall not be left on the beach or in tidal areas after use.

3. Collection of wild seaweed

3.1 Definition

⁵⁵ In this case, at least the requirements of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended with respect to the growing areas for seaweed are to be complied with.

Part B; VIII. Supplementary regulations for the cultivation and collection of marine macroalgae (*Chlorophyceae*, *Phaeophyceae*, *Rhodophyceae*)

“Wild seaweed” is defined in analogy with “wild grown products” (refer to “Naturland Standards on Production; Part B.X.1.):

“Wild grown products” are defined as products that have grown without or with low influence of the operator gathering the products. The harvest has to be planned and carried out applying a sustainable system that is ecofriendly and socially acceptable.

This means in detail:

- The plants must not be cultivated, i.e. any measures to enhance or protect growth shall not be taken, or kept on a very low level.
- In their location the plants have to be found naturally.

The human interference consists mainly of the harvest (gathering) of these wild grown products or in measures taken to protect their natural growth potential.

Due to their extremely fragile nature resp. long growing conditions or potential habitat damage due to harvesting activities etc. the harvest of certain seaweed species (see Appendix 2) cannot be considered as sustainable according to the current state of knowledge. These species are therefore excluded from certification.

3.2 Requirements

3.2.1 The harvesting areas have to be clearly identified and adequately mapped, indicating each harvesting site.

3.2.2 All legal aspects regarding land ownership, harvesting rights etc. have to be clarified and documented. The individual harvesting rights have to be arranged and defined clearly within the collection area.

3.2.3 Before the start of each collecting season, the maximum amount to be harvested has to be defined annually. For this, the following information has to be available:

- A yearly biomass estimation of the algae before harvesting season.
- Regular monitoring and documentation of changes of algae stocks for size, density, colour, composition and regeneration.

3.2.4 In case of evident reduction of seaweed biomass resp. other impacts on the stock, appropriate counteractions have to be taken (e.g. reduction of harvest biomass; fallowing of harvest area).

3.2.5 If the harvesting area is used by a group of harvesters, the Naturland requirements for an ICS (Internal Control System) apply (see Naturland document “Minimum Requirements of an Internal Control System (ICS) for Smallholder Grower Groups”).

3.2.6 Harvesting methods shall minimize damage to seaweed and substrate. Only selective harvesting methods shall be applied. Manual harvesting methods are to be preferred. Motorized harvesting techniques are only allowed, if they demonstrably do not have a negative impact on the marine ecosystem.

3.2.7 Wild harvested seaweeds shall be harvested in a manner that safeguards continued reproduction of the algae. Collectors shall not remove the entire algae, but have to leave the necessary plant elements required for the plant to re-grow on its own.

4. Post harvest

Seaweed shall be processed as soon as possible after harvest. All processing steps as well as storage etc. shall be aimed at conserving the quality of the algae at its best.

The use of direct flames for drying seaweed is prohibited. Seaweed shall not be situated in the combustion chamber, but have to be dried via a heat exchanging device that prevents direct contact with flames or harmful smoke/gases.

For flushing of the algae, seawater of appropriate quality is to be preferred to save drinking water.

For the algae products, an analysis protocol according to article A.I.6 has to be followed.

IX. Supplementary regulations for the cultivation of microalgae for human consumption (e.g. *Spirulina*, *Chlorella*)

1. Cultivation systems

The area of application of this standard covers the cultivation of microalgae (e.g. *Spirulina*, *Chlorella*) in artificial open and closed facilities (concrete, fibreglass etc.)

2. Requirements for the culture media

Only those vegetable ingredients of agricultural production are permissible which meet the certification requirements of the list of priorities shown in Naturland's processing standards (see Part C. VI. 4.1).

Besides this, the following regulations apply:

- water of drinking water quality
- table salt, iodised table salt (calcium carbonate (E 170)) is permitted as anti-caking agent
- cultures of micro-organisms, cultivated on organic substrata, if available
- sodium bicarbonate (NaHCO_3) (E 500) to regulate the pH-value and the carbon dioxide (CO_2) content of the nutrient solution
- mineral nutrients and trace elements, preferably from naturally occurring sources with known composition (e. g. stone meal) and only after the approval of Naturland has been granted⁵⁶

Particularly the following may not be used as culture media

- enzymes
- food additives
- nitrogen and phosphorus from inorganic or fossil sources (e. g. ammonium nitrate, sodium nitrate, rock phosphate (raw), guano)
- products from conventional agricultural origin
- animal products and dung, even of organic agricultural origin

3. Waste water quality

3.1 In the case of land-based facilities, the nutrient content of the wastewater must be proven to be no higher than the nutrient content of the inflowing water. The only exception is for wastewater which is to be disposed off in the communal sewerage system.

3.2 The quality of the wastewater is to be determined regularly (at least once every three months) using suitable analytical methods, and the results have to be recorded in writing.

3.3 Where marine microalgae are produced in saltwater solutions, care must be taken that the salt content of the wastewater does not exceed the salt content of the fresh water extracted.

4. Quality assurance

The quality of the water in the cultivation phase has to be verified by analyses at least once every three months. Special attention is to be paid to monitoring any accumulation of residues.

In the case of algae produce, the analysis protocol set down by Naturland (see Part A; I.6) is to be adhered to.

5. Cleaning and disinfection

All facilities, equipment and materials used in the breeding, selection, establishment of starter cultures and mass propagation of organically grown microalgae are cleaned using mechanical or thermal methods.

If this is not sufficient, those agents may subsequently be used which are listed in Annex 3 under "in the presence as well as in the absence of aquaculture animals".

⁵⁶ The use of isolated mineral nutrients and trace elements is only permitted in justified cases by way of exception and may not serve to enrich the product deliberately with these nutrients

Appendices aquaculture:

Appendix 1: Requirements regarding fishmeal/-oil used as feed

All feed originating from wild marine fauna has to be harvested in compliance with internationally established sustainability standards*. Wherever possible, this shall be confirmed by producing proof of independent certification.⁵⁷

The following sources are permitted:

- Products from organic aquaculture
- Fishmeal/-oil from trimmings of wild fish processed for human consumption
- Fishmeal/-oil from by-catches of captures for human consumption

The use of fishmeal/-oil from other sources* may be applied for the solely purposes of safeguarding quality⁵⁸. Compliance with these special demands, as well as other requirements which are in general valid for feeds admitted by Naturland, will be confirmed by Naturland by a separate inspection and certification procedure.

Appendix 2: Wild grown algae species currently excluded from organic certification:

- *Lessonia nigrescens* and *Lessonia trabeculata* from the coasts of Chile and Peru
- Threatened kelp forests (*Macrocystis pyrifera*) from S. California coast
- *Lithothamnion* (Maerl) from UK area
- *Durvillaea antarctica* from S. Chile, S. Argentina, S. Australia
- *D. potatorum* from S. Australia
- *Ecklonia maxima* from Atlantic coast of South Africa

Appendix 3: Permissible cleaning and disinfection substances

In the absence of aquaculture animals	In the presence as well as in the absence of aquaculture animals
<ul style="list-style-type: none"> • Ozone (only permissible in rearing/young stock stations and tanks for the post-harvest maintenance of fishes) • Sodium hypochlorite • Calcium hypochlorite • Calcium hydroxide • Calcium oxide • Caustic soda • Alcohol • Potassium permanganate • Tea seed cake of natural camellia seed (use restricted to shrimp production) 	<ul style="list-style-type: none"> • Limestone (calcium carbonate) for pH control • Dolomite for pH correction (use restricted to shrimp production) • Sodium chloride • Hydrogen peroxide • Sodium percarbonate • Organic acids (acetic acid, lactic acid, citric acid) • Humic acid • Peroxyacetic acids • Peracetic acids • Iodophores (only in the presence of eggs)

* The detailed stipulations of the regulation (EU) 2018/848 and of the subsequent legislative acts as amended are to be observed.

⁵⁷ This certification is at all events required for feed made from whole fish caught in the wild.

⁵⁸ particularly for lowering P-content in order to prevent eutrophication

Appendix 4: Requirements with respect to keeping cleaner fish in net cages (e.g. lumpfish *Cyclopterus lumpus*, ballan wrasse *Labrus bergylta*, cuckoo wrasse *Labrus mixtus*, goldsinny wrasse *Ctenolabrus rupestris*)

- 4.1** Cleaner fish may only be stocked if they occur naturally in the area. The preferred origin is from organic aquaculture, and secondary to that from conventional aquaculture. Wherever they are not available (obligation to notify and provide evidence), cleaner fish obtained from fisheries may be used⁵⁹.
- 4.2** The health and wellbeing of cleaner fish must be guaranteed; the principles of Health and Hygiene as per B.I.6 apply to them, too⁶⁰. Before applying allopathic treatments specific to the cleaner fish, they should be separated from the other species which are being kept. At all events it must be ensured that the Naturland standards⁶¹ applying to the primary species are not compromised.
- 4.3** To ensure the wellbeing of the cleaner fish, they must be provided with a sufficient number of shelters (e. g. artificial seaweed) in the net cages. The shelters should not be situated within the active feeding zone of the primary species.
- 4.4** Cleaner fish must be fed with supplementary feed to ensure their wellbeing, especially in periods with unfavourable temperatures. The supplementary feed must be adapted to the nutritional requirements of the species. The feed is to be introduced in such a way that the other species kept cannot use the supplementary feed to a significant degree (e.g. by introducing feeding trays, a dedicated feeding area, specific feed size). Organic feed must be used in accordance with the specifications of B.I.9.3. Where such supplementary feed is not available (obligation to notify and provide evidence), conventional feed may also be used.⁶²
- 4.5** Records are to be kept of the cleaner fish kept (species and number of fish, survival rates, stocking densities, origin of the fish, feed, medication etc.). Naturland must be informed of mass mortality events. The mortality is to be recorded and the causes of the mortality are to be determined as far as possible and remedial measures adopted.
- 4.6** The cleaner fish may not be released into the natural environment at the end of a production cycle. The cleaner fish may be restocked if the fish are in good health. Cleaner fish must be killed quickly and efficiently, as per the stipulations of B.I.10. Their remains must be properly recycled.

⁵⁹ This is a transitional arrangement until the organic aquaculture of cleaner fish has been established. In the long term the aim is to become independent of wild caught fish.

⁶⁰ The use of allopathic medication for cleaner fish is exempt from the restrictions stated in B.I.6.2.

⁶¹ In particular B.I.6 Health and Hygiene.

⁶² This is a transitional arrangement until organic feed for cleaner fish is available.

Naturland

Association for Organic Agriculture e.V.
Kleinhaderner Weg 1
82166 Gräfelfing | Germany

Tel. +49 (0)89-898082 - 0
Fax +49 (0)89-898082 - 90

naturland@naturland.de
www.naturland.de



Naturland