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Online courses

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1. Table of Contents

2. Executive summary

CIHEAM Bari, The Mediterranean Agronomic Institute of Bari, produced this report as a part of the Future growth in sustainable, resilient and climate friendly organic and conventional European aquaculture (FutureEUAqua) project, Work Package 7. CIHEAM-Bari has developed two facilitated courses and a self-learning course according to the international E-Learning standards[1] to promote the use of end-user material beyond the stakeholder/industry innovation groups and the knowledge platform of the project. This report provides a description of these courses. Facilitated courses were developed using Leaning Management System (LMS) on the CIHEAM-Bari e-learning platform and were addressed to 357 participants from 73 countries (23% European countries and 76% non-EU Mediterranean countries and other countries). Participants represented different institutions and profiles, such as ministries of agriculture, Universities, associations, certification bodies, farmers, private companies, research centres, extension services etc. The self-learning course is delivered on the project knowledge platform to be followed indefinitely by users even after the end of the project.

3. Introduction

Aquaculture is an increasing economic driving sector in Europe[2], with organic aquaculture representing the 4.6% of total aquaculture production. Yet, the economic performance of EU organic aquaculture seems far from being satisfactory. Notwithstanding the above, Europe is still heavily dependent on external markets to cover seafood demand, which is why fisheries and aquaculture sectors require paramount need to (i) enhance knowledge sharing and co-creation, (ii) set up appropriate infrastructures and facilities and (iii) increase capacity building for experts and practitioners. In order to overcome these needs, organising trainings based on an "active and participative" method that allow participants to fully learn news concepts, while improving skills and capabilities, could prove strategical. For this reason, within the project FutureEUAqua – increased capacity, CIHEAM Bari has designed and facilitated the online training program on "Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond", based on one of the most profitable participative methods, known as "Peer learning", a form of collaborative instruction that enhances the peer-to-peer interaction and positive learning. The 6-week course, structured in four modules, involved 357 participants coming from 73 countries: mainly from Europe and Mediterranean region (60%). Due to the dropout phenomena[3], 47

[1] E-learning standards refer to a system of common rules for content, authoring software and Learning Management Systems (LMSs). Specifically, this course abides by Claroline LMS rules that specify how courses can be created and delivered over multiple platforms so that they all operate seamlessly together. Claroline as LMS tools allows to create learning paths (compatible with Shareable Content Object Reference Model (SCORM).

[2] https://www.eea.europa.eu/data-and-maps/indicators/aquaculture-production-4/assessment

[3] "Dropout is commonly defined as a student's failure to enrol for a definite number of successive semesters. However, the issue is controversial and there is an array of different dropout definitions in the literature." Xavier. M., Meneses, J., & Fiuza, P. J. (2022) *Dropout, stopout, and time challenges in open online higher education: A qualitative study of the first-year student experience*, Open Learning: The Journal of Open, Distance and e-Learning. https://doi.org/10.1080/02680513.2022.2160236

participants reached the threshold score to get the certificate. Furthermore, the training resulted in promoting the sustainable growth of aquaculture among involved stakeholders, to meet future challenges considering the growing consumer demand for high quality, nutritious and responsibly produced food. The outcomes of the course attempted also to increase the awareness of the sector, creating a community of practice where peers shared their technical and social knowledge with the final scope to transform project results and outputs, when implementing the innovative solution identified and developed, into practical knowledge.

4. Facilitated Courses

4.1 General Overview

FutureEUAqua is a Horizon 2020 project with 31 partners, kicked off in November 2018 and set to end in April 2023.

The overall objective of FutureEUAqua is to effectively promote the sustainable growth of climate-change resilient, environmentally friendly organic and conventional aquaculture of major fish species and low trophic level organisms in Europe, to meet future challenges with respect to the growing consumer demand for high quality, nutritious and responsibly produced food.

The European Green Deal and the Farm to Fork Strategy underline the potential of farmed seafood as a source of protein for food and feed with a low-carbon footprint which has an important role to play in helping to build a sustainable food system. The Farm to Fork Strategy also sets specific targets for aquaculture, in particular the reduction of sales of antimicrobials and a significant increase in organic aquaculture by 2030.

When the FutureEUAqua project started, aquaculture production in the EU had reached 1.25 million tonnes of seafood annually, with a value of over 4 billion euro. Of this amount, 4% was certified as organic, amounting in 2015 to a total of approximately 50,000 tonnes. In 2015, EU consumers spent 54 billion euro for buying fisheries and aquaculture products, reaching the highest amount ever recorded. Nevertheless, Europe was still heavily dependent on external markets to cover this demand. Thus, EU aquaculture need to increase the competitiveness of its products and respond to consumer demands for high-quality and safe food, in a challenging context of climate change, greater competition for natural resources, and conflicting interests for space and markets.

Organic production - mainly mussels, oysters, trout, salmon, carp, sea bass/seabream - have increased by 25% compared to 2012. Nevertheless, significant bottlenecks present in organic farming needed to be overcome in order to maintain this positive trend.

To ensure food and nutrition security by 2030, the food production sectors have to sustainably expand in terms of space use, production and new value chains, exploring and enhancing innovation opportunities offered by sustainable and resilient aquaculture production systems, implementing the circular economy principles and increasing social acceptance of the corresponding activities and products.

European aquaculture, with a lower carbon footprint compared to cattle, pork and even poultry, has the potential to effectively address these challenges and contribute positively to the implementation of the UN Sustainability Development Goals (SDGs) commitments.

Future aquaculture needs to manage production of high quality, safe food for a growing population, without harming the environment and without compromising animal health and welfare. To succeed, improvements are demanded along the whole value chain, i.e. from egg to fork.

For conventional and organic aquaculture, sustainable production requires smart breeding programs, feeds and production technologies that meet the requirements of the different farmed aquatic species. To minimise climate impacts, feed ingredients from low trophic levels and circular economy are important.

The need for increased efficiency of space and resource use can be brilliantly approached by new technologies, both on land and in water, amongst others RAS (Recirculating Aquaculture Systems) and IMTA (Integrated Multitrophic Aquaculture). Moreover, conventional open cage production systems need to be managed smartly and significantly reduce their nutrient discharges, escapes and disease incidences.

In aquaculture lays great part of the food production sectors' responsibility to ensure food safety in the future without jeopardising the environment or the consumers' and animals' health and welfare.

More high-quality organic food products, low in undesirable compounds, packed in smart zero waste solutions, together with economic conventional seafood products with lower environmental footprint, produced by selected champion breeds for nutrient utilisation efficiency and robustness, grown responsively and more effectively managed by non-invasive monitoring technologies are needed.

FutureEUAqua addresses these aspects and can bring future EU aquaculture to this end by promoting innovations in the whole value chain, including:

- Sustainable breeding: Assessing, validating and demonstrating the level of the ability of the current breeding programs, breeding goals and methodologies.
- Ingredients & feed: Ensuring sustainable and resilient production by focusing on high fish performance, health and product quality in fish fed with novel and sustainable low trophic feed ingredients.
- Production systems: Documenting tailor-made fish performance in future cost-effective production systems that function optimally and secures fish health and welfare.
- Quality & Safety: Developing innovative high quality minimally processed fish products and related packaging conditions, in order to valorise aquaculture raw materials.
- Monitoring technologies: Monitoring the impact of housing environments and innovative diets on the fish health and welfare.
- Consumer awareness: Improving consumer awareness, perception and acceptance of European aquaculture products and methods.

4.2 Course preparation

4.2.1 Course promotion and call launching

Two **newsletters** (fig. 1) were written to inform on the opportunity to take part in the online training course with the title "Call for participation | FutureEUAqua Project online Course on "Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond" | Training program facilitated by CIHEAM Bari | Deadline for application 20 June 2022".

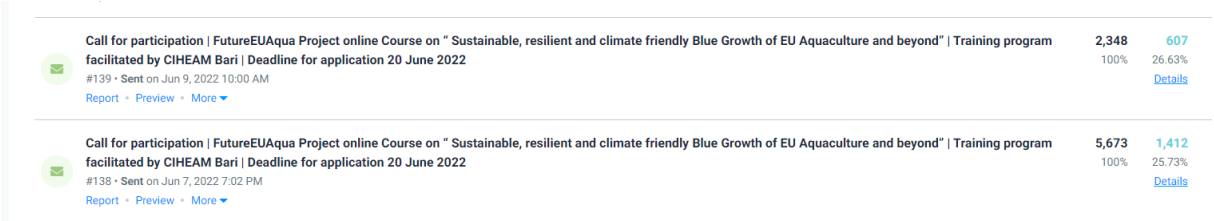


Figure 1 - Newletters by CIHEAM Bari Alumni Network (FTN)

- The 1st newsletter (#139) was sent on June 9, 2022 and it was opened by **1381** people out of 5673 recipients.

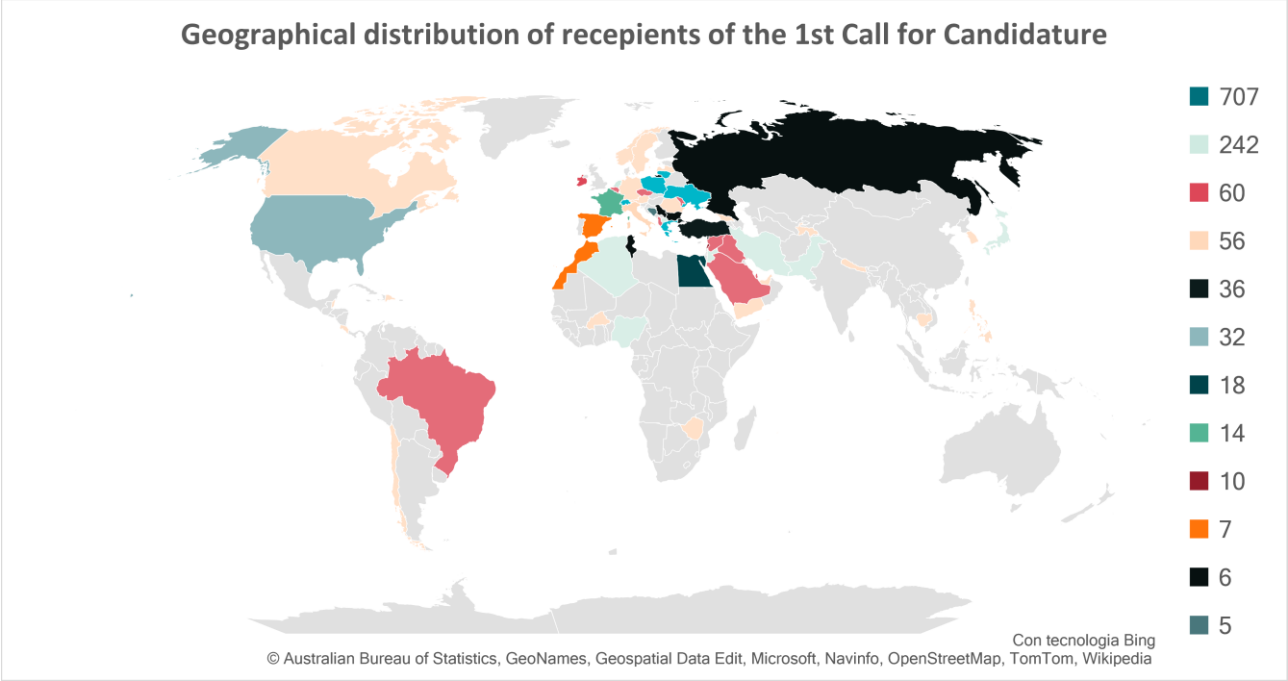


Figure 2 - Geographical distribution of numbers of recipients of the 1st Call for Candidature (Newsletter 139).

The countries from which the highest number of opens was registered are Netherlands (242), Ireland (60), Italy (56), Turkey (36) and United States (32). Surprisingly, nobody from Netherlands applied for participation and, among the countries above, Italy had the highest number of participants in the course (17). Egypt, which was eventually the country with most participants in the course (41), recorded 18 recipients of the newsletter (fig. 2).

- The 2nd newsletter (#141) was released on June 15, 2022 and **590** recipients out of 2348 opened it.

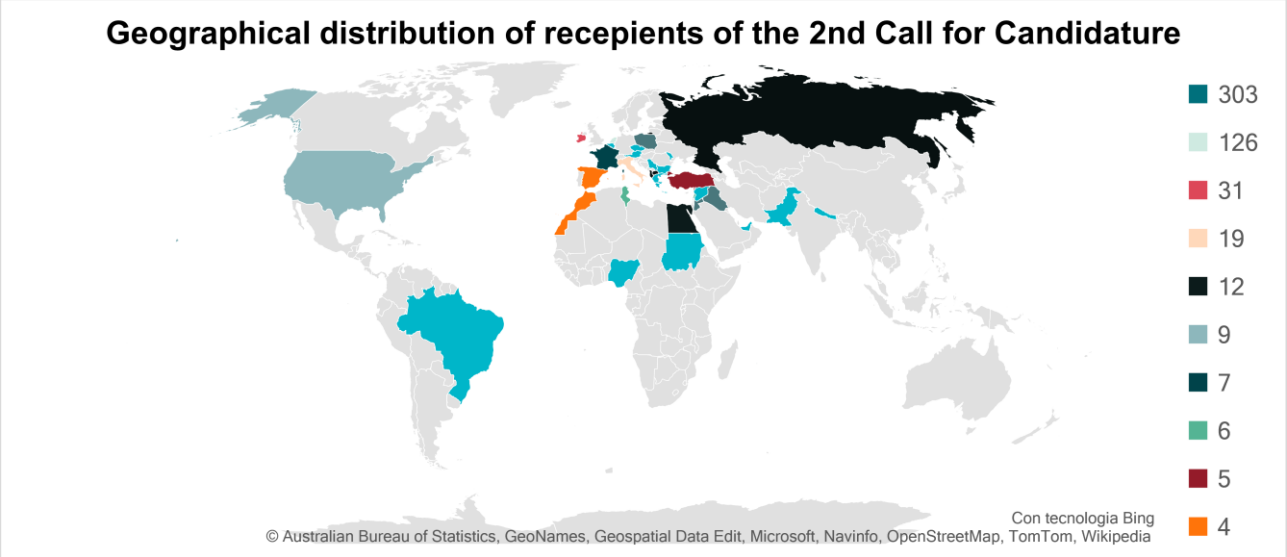


Figure 3 - Geographical distribution of numbers of recipients of the 2nd Call for Candidature (Newsletter 141)

Netherlands was again the country with the highest number of recipients (126), followed by Ireland (31), Italy (19), Egypt (12) and United States (9) (fig. 3). It is interesting to notice how Nigeria was one of the countries with the highest number of participants (25), despite having only 3 recipients of the 1st newsletter and 1 recipient of the 2nd newsletter.

The **call for application** was launched on June 6th 2022, on CIHEAM Bari website: https://www.iamb.it/en/news_and_events/one?event=call-for-application-online-course-sustainable-resilient-and-climate-friendly-blue-growth-of-eu-aquaculture-and-beyond&id=680. Those interested in participating in the online training course needed to fill out an application form attached to the call (fig. 4)

Figure 4 - Application form

The application form was structured as follows. Participants were asked to indicate their name, surname, email, country of origin, organization or institution/company, position, belonging group and which type of stakeholder they were. The possible answers to the question “which group do you represent?” where: international organization, scientific community (higher education, research), industry/private sector, civil society, NGOs and other (the latter with a required specification). The question “what type of stakeholder are you?” presented the following answer choices: innovation broker, small / medium enterprise manager, large enterprise manager, policy maker and other (the latter with a required specification). Once the required information was inserted by participants, they were asked to tick “I have read and accepted the privacy policy”, after which their subscription was sent.

4.2.2 Candidate selection

Once received all the subscriptions, the CIHEAM Bari team organized a mailing list of those who had properly filled the application form and who fell under the categories envisaged in the same, by also eliminating double subscriptions, and created the login credentials to access the platform where the course would be held. All participants were sent their own credentials to be able to follow the course.

4.2.3 Instruction interactions for content production

CIHEAM Bari course Instructional designer and coordinated interacted face-to-face with the instructors from selected FutureEUAqua Work Package`s and remotely communicated with them to guide the creation of contents according to CIHEAM Bari guidelines (fig. 5) and approach.

CIHEAM BARI

SHORT GUIDE FOR THE PRODUCTION OF INSTRUCTIONAL MATERIALS (MODULE CONTENTS) FOR THE E-LEARNING COURSE

In order to make the final content be effectively delivered in e-learning, the instructional material (that will make up the teaching module*) must comply with the design specifications and criteria that are shortly summarized below.

For each module, ***instructional materials*** *provided by the teacher/instructor follow:*

1) Title

2) Objectives, to be expressed in a concise way, if possible, using active verbs (see example)

3) Introduction, to be nearly 15-lines long (see example)

4) Content layout or list of sections to be developed (see example)

5) Sections content to be written down in a short text explaining the main concepts to be studied **(2-3 pages per section; about 12-13 total number of pages per module (about 2 hours of study time)**

6) In-depth texts, generally short (max 2 pages), might be attached to the teaching content with specific references or links to keywords clarifying concepts that have not been explained or deepened in the sections

7) Figures, tables, schemes, diagrams and short videos to be inserted or linked in the contents, with indication of their title, source and exact position or word the object must be linked to

8) End-of-module test, which has an educational function and can be autonomously used by students. It is advised to add objective verification tests (a typical sequence of items might be true/false, multiple choice and fill in the blank questions). Each test must be accompanied by correct answers (see example)

9) Practical exercises, which need to have the clear purpose to put into practice the notions learned

10) Glossary. It is the list of the specific technical terminology of treated topics, with explanation of each term

11) Bibliography and Linkography. It is a single category including additional teaching materials that are necessary to strengthen and enhance the learning outcomes.

Figure 5 - Guidelines for the creation of modules

4.3 Course implementation

4.3.1 Participants

The registration to the course were open from 6th June to 30th June. Most of the people who registered were selected to take part in the training course, with a total number of 357 participants from 73 countries (namely: ***Albania, Algeria, Austria, Azerbaijan, Bangladesh, Belgium, Belize, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Côte d'Ivoire, Democratic Republic of Congo, Egypt, Estonia, Eswatini, Ethiopia, France, Georgia, Germany, Ghana, Greece, Guinea-Bissau, India, Iraq, Ireland, Italy, Jordan, Kenya, Kosovo, Latvia, Lebanon, Liberia, Lithuania, Macedonia, Madagascar, Malaysia, Mali, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Nigeria, Norway, Pakistan, Palestine, Perù, Portugal, Romania, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Slovakia, Somalia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Tanzania, Tunisia, Turkey, Uganda, United Kingdom, Vietnam, Yemen, Zambia and Zimbabwe***). Hence, the geographical distribution of participants is: 23% (83 participants) from European countries (geographic Europe); 37% (130 participants) from

MENA countries; 40% (144 participants) from other countries, above all from Africa. The top 11 countries for the number of participants are: Egypt (42), Morocco (28), Tunisia (25), Nigeria (25), Italy (17), Kenya (16), Ethiopia (12), Algeria (11), Portugal (10), Zimbabwe (9) and Jordan (9). As to the gender, 58% of participants were men and 42% women.

Different types of stakeholders were involved: Small and Medium Enterprise Managers 32% (114 participants), Policy Makers 18% (65 participants), Innovation Brokers 16% (59 participants), Large Enterprise Managers 2% (6 participants). The remaining 113 participants (32%) fell within the category "Other", which was mainly composed of researchers (41 participants), PhD students, students and people from the academic/education field.

A consistent share of participants, namely 45% (160 participants) were part of the Scientific Community (Higher Education, Research). Other belonging groups were: Industry/Private Sector 18% (63 participants), Public Sector 13% (46 participants), NGOs 9% (33 participants), International Organization 6% (22 participants), 'Other' 6% (22 participants) and Civil Society 3% (11 participants). The category 'Other', in the case of belonging groups, was quite varied, which made the identification of further subcategories unfeasible.

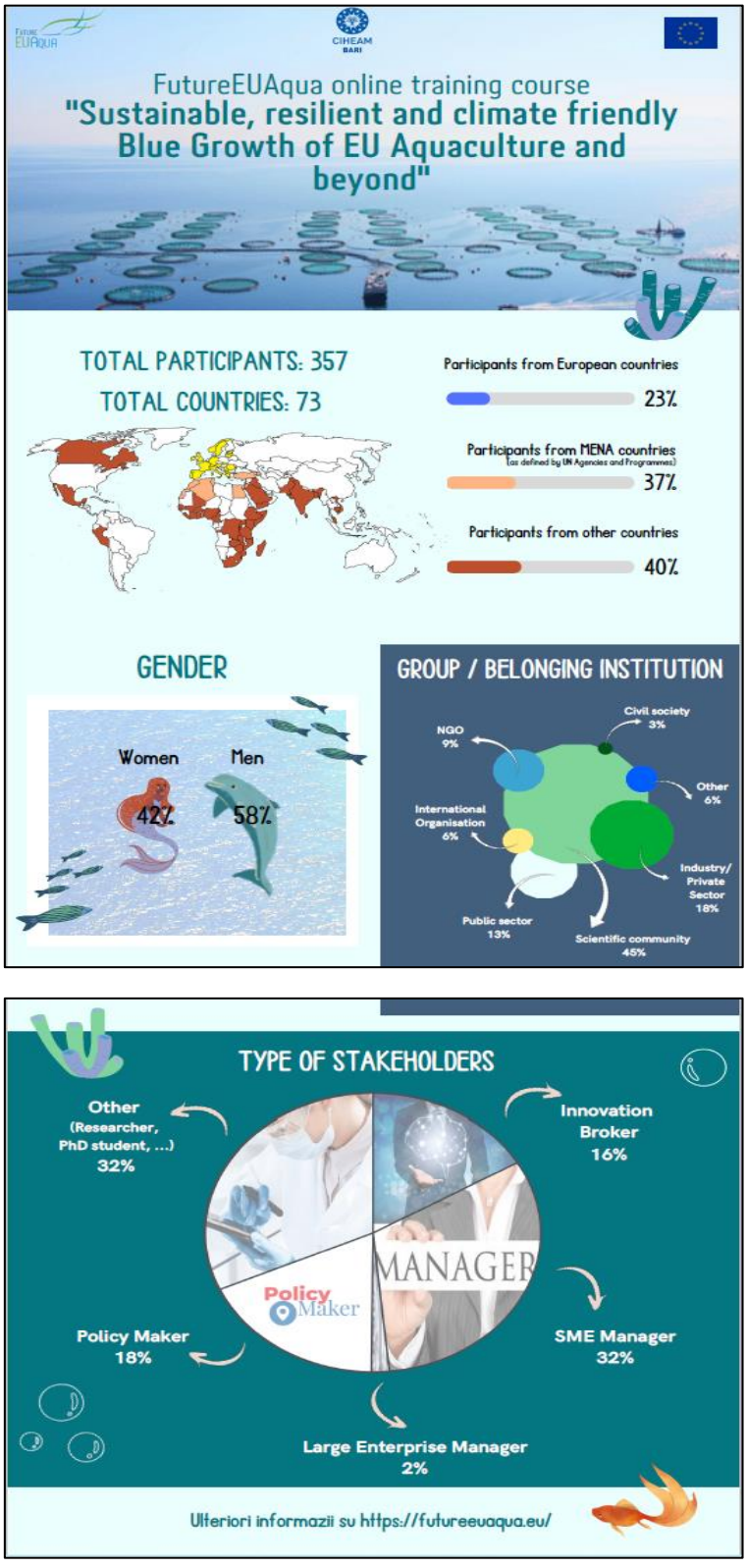


Figure 6 - Infographic and visual analytics of online course participants

4.4 Course structure

4.4.1 Course programme

https://www.iamb.it/uploads/attachments/2100/FutureEUAquaTrainingprogramonlinecoursecurricula.pdf

This course is structured 1 Introductory, 3 thematic and 1 Recovery sessions, which have been released and implemented from 15 June 2022 to 29 July 2022 for facilitated learning. Instead for self-learning, the training program has been made available for extra 12 months on the project website (Training material)

Table 1 - Course modules

Module 0	Introduction to eLearning methodology and approach	1 week
Module I	Innovative feeds and feeding strategies for improving welfare & performance of fish in sustainable and organic aquaculture	3 weeks
Module II	Consumer perception and preferences regarding aquaculture	1 week
Module III	Regulatory framework for aquaculture in the EU, with special focus on organic aquaculture	1 week
Module IV	Recovery/ retake and final synthesis	1 week

4.5 Tools and activities

The E-eLearning course was delivered on a Web based platform. The "Peer learning" approach was adopted to set up a "Community of Practice (CoP)" sharing common interests and stimulating participants to interact in a constructive and open-minded discussion. The interaction occurred in a discussion forum, on the platform, through which significant contributions were beneficial to the course contents (collaborative method).

Claroline was selected as Learning Management System (LMS) based on the applied methodology and adopting the most appropriate solutions, in terms of both user-friendliness and the cost-benefit ratio (Open Source). Each participant was provided with a username and password to enter the platform. Once the participant enters, Claroline demonstrates the platform structure (fig. 7) which contains tools (i.e. course description, agenda, learning path, announcements, documents, forum, links) to facilitate the learning process.

Each participant had to follow each module by doing tasks classified in the following categories:

- Individual learning: to read the main teaching material provided in the "learning path" section (i.e. fig. 8) and the complementary material in the "document" section.
- Group discussion and Interaction: to enter the "discussion forum" section to discuss with other group members the module content (i.e. to: open discussion, raise questions, develop the ideas or answer the questions raised by other members, provide comments….)

Interaction means that participant posts may:

1. **INITIATE** - Any post which initiated a new discussion

2. CRITIQUE/DEVELOP - Any post which continued a discussion by developing, revising, or adding to the previous post

3. SOCIAL/SUPPORT - Any post which continued a discussion with a 'me too' or support without developing the ideas of the previous post

4. HELP - Any post which requests help from other participants

Figure 7 - Platform structure and interface

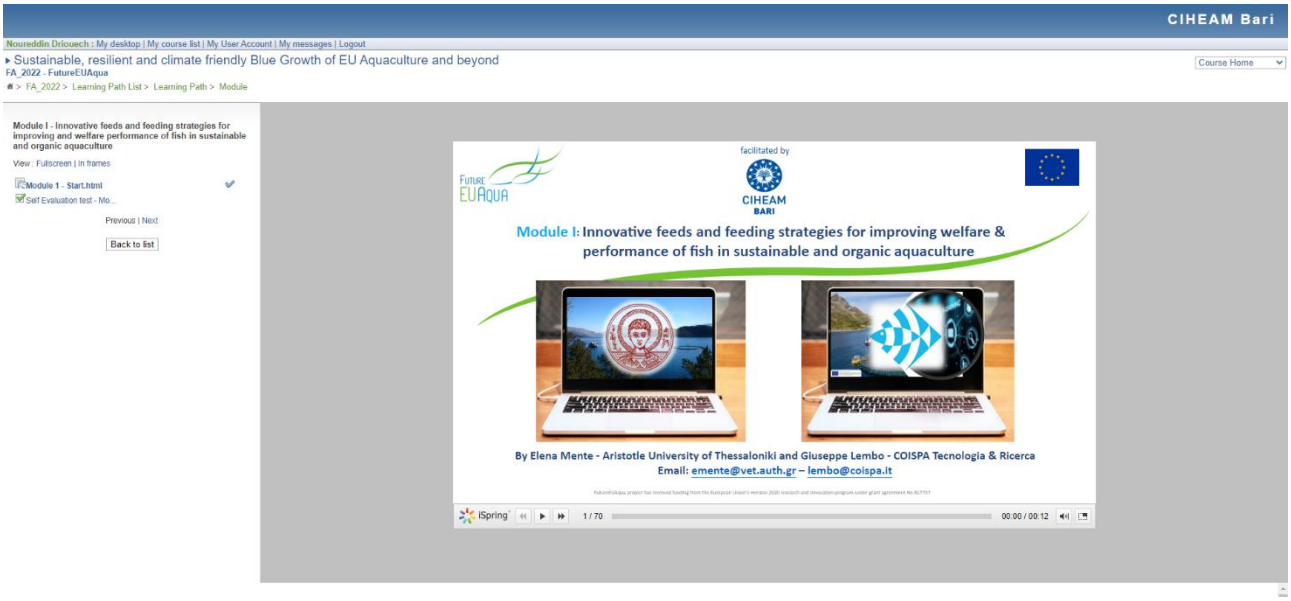


Figure 8 - Platform structure and interface

4.6 Teaching materials

Course material (fig. 9) were basically based on a PowerPoint presentation containing a theoretical background and supported by related specific tools (Background, knowledge gaps, Learning objectives, abstracts, body-text, data, videos, web pages etc.) elaborated in collaboration between CIHEAM Bari Instructional Designers and with FutureEUAqua partners http://www.futureeuaqua.eu. The material was prepared in English by the course coordinator and e-tutor: first starting by screening the available content in order to extract all the tools that are linked to the module; a second screening was done to the extracted tools to filter the English based one. Selected tools were integrated in the on-line courses and used to support the arguments covered in the PPT presentation. Furthermore, the list of references and further reading, linkography and evaluation forms were provided in the "document" section of the platform.

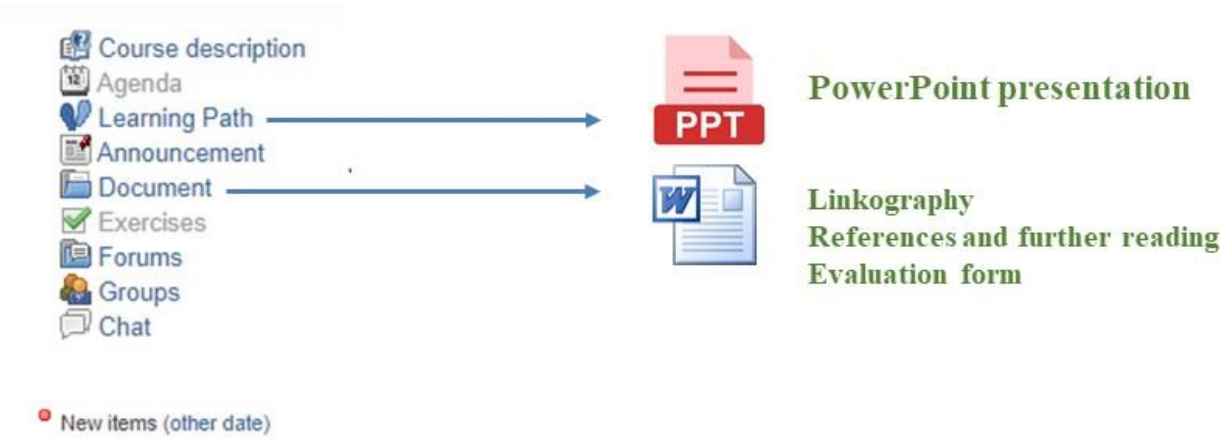
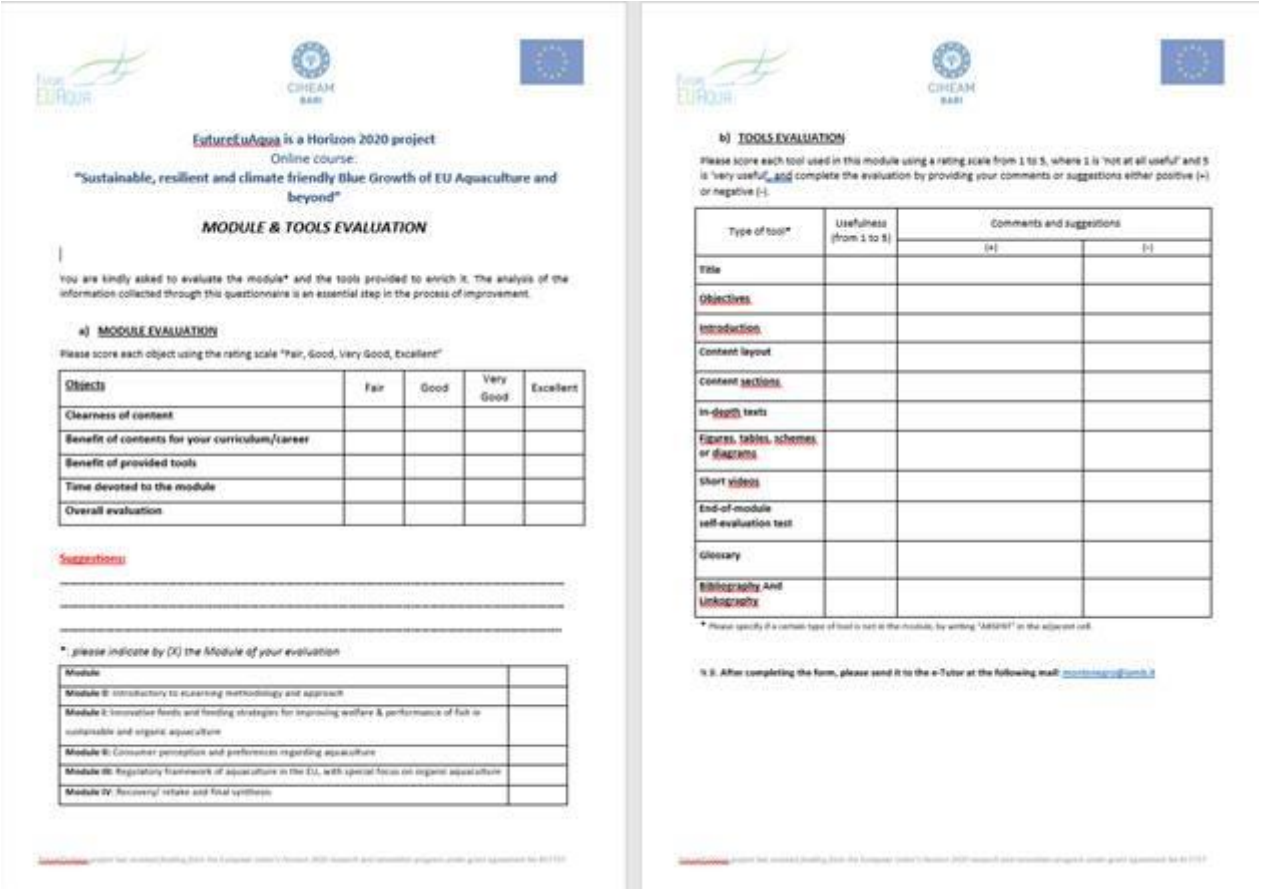


Figure 9 - Platform sections

4.7 Module and tools evaluation

At the end of each module/course participants were asked to fill in an evaluation form to evaluate the module and tools provided in the module (fig. 10). The module evaluation included five categories (fair, good, very good and excellent) to be evaluated while in the tool evaluation, participants were asked to evaluate each tool by giving a score from 1 – to 5 (i.e. 1 means 'not at all useful' and 5 means 'very useful'). The results of the evaluation are in the annex. Both evaluations were complemented with specific comments or suggestions area. It is worth mentioning that all the comments were included in this report as they were written by participants without any modification or language correction.

A tutor was assigned by CIHEAM-Bari to the group in order to: prepare the teaching materials, guide the participants through the learning process, moderate the discussion forum and interactions, answer questions or address them to the external experts whenever needed (the system facilitated the access of any external expert to the discussion forum), monitor and solve any occurred technical problem, collect and elaborate evaluations.



FutureEUAqua is a Horizon 2020 project

Online course:

"Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond"

MODULE & TOOLS EVALUATION

You are kindly asked to evaluate the module* and the tools provided to enrich it. The analysis of the information collected through this questionnaire is an essential step in the process of improvement.

a) MODULE EVALUATION

Please score each object using the rating scale "Fair, Good, Very Good, Excellent"

Objects	Fair	Good	Very Good	Excellent
Clearness of content				
Benefit of contents for your curriculum/career				
Benefit of provided tools				
Time devoted to the module				
Overall evaluation				

Suggestions:

*: please indicate by (X) the Module of your evaluation

Module	
Module I:	
Module II:	
Module III:	
Module IV:	

b) TOOLS EVALUATION

Please score each tool used in this module using a rating scale from 1 to 5, where 1 is 'not at all useful' and 5 is 'very useful', and complete the evaluation by providing your comments or suggestions either positive (+) or negative (-).

Type of tool*	Usefulness (from 1 to 5)	Comments and suggestions	
		(+)	(-)
Title			
Objectives			
Introduction			
Content layout			
Content sections			
In-depth texts			
Figures, tables, schemes or diagrams			
Short videos			
End-of-module self-evaluation test			
Glossary			
Bibliography And Linkography			

* Please specify if a certain type of tool is not in the module, by writing "ABSENT" in the adjacent cell.

N.B. After completing the form, please send it to the e-Tutor at the following mail:

Figure 10 - Module & tools evaluation form

4.8 Monitoring

The course was monitored by the tutor and by an IT monitoring system which reported the access history of all participants to all eLearning tools.

4.9 Course outcome

The courses were completed successfully. Participants showed interest and satisfactory impression on the course particularly on material organization and presented tools. The courses were beneficial and modules provided 48 participants with relevant knowledge in the organic aquaculture, and helped them to contribute to the development of the organic aquaculture sector in their countries.

Two different types of certificates were issued by CIHEAM-Bari and Coordinator of FutureEUAqua project:

- A certificate of successful attendance, which was sent to 25 participants (fig. 11);
- A certificate of attendance, which was sent to 23 participants (fig. 12).

International Centre for Advanced Mediterranean Agronomic Studies

CERTIFICATE

The Director of CIHEAM Bari and the Project Coordinator certify that

Name Surname

successfully attended the course on

Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond

that was held online from 20 June to 29 July 2022 in the framework of the FutureEUAqua Project

Åsa Maria Espmark
Project coordinator, NOFIMA

Maurizio Raeli
CIHEAM Bari Director

C.A. ???/2022

Grant Agreement number: 817737 — FutureEUAqua — H2020-BG-2018-2020/H2020-BG-2018-1

Figure 11 – Successful attendance certificate template

International Centre for Advanced Mediterranean Agronomic Studies

CERTIFICATE

The Director of CIHEAM Bari and the Project Coordinator certify that

Name Surname

attended the course on

Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond

that was held online from 20 June to 29 July 2022 in the framework of the FutureEUAqua Project

Åsa Maria Espmark
Project coordinator, NOFIMA

Maurizio Raeli
CIHEAM Bari Director

C.A. ???/2022

Grant Agreement number: 817737 — FutureEUAqua — H2020-BG-2018-2020/H2020-BG-2018-1

Figure 12 - Attendance certificate template

The participants to provide with the final certificate were selected during the follow-up of the course implementation according to the following criteria:

- Attendance >/=75%, all self-evaluation tests completed and best score >/=30: for successful attendance;

- Attendance of all modules but not all self-evaluation tests completed, or attendance of all modules (+ downloads module 0) but no self-evaluation test carried out, or attendance of X modules + 1 self-evaluation test carried out, or attendance of X modules but no self-evaluation test carried out: for attendance.

Each attendee was provided with his own certificate of (successful/mere) participation via email with the following communication:

Dear Mr./Ms._____,

On behalf of CIHEAM Bari and the e-Learning instructional design team, we are proud to deliver to you the certificate of (successful) attendance in the FutureEUAqua Project online Course on "Sustainable, resilient and climate friendly Blue Growth of EU Aquaculture and beyond". Please find attached the certificate countersigned by the director, Mr. Maurizio Raeli, and the FutureEUAqua project coordinator, Ms. Asa Maria Espmark.

We hope that the course has been a fruitful opportunity to deepen your knowledge on organic aquaculture and that we will keep you updated about possible future online training courses. Stay tuned for the final conference of FutureEUAqua project foreseen on 18th-21st April 2023 (https://futureeuaqua.eu/).

For you information and for your network, all teaching materials were moved to the project website (https://futureeuaqua.eu/index.php/training-material/).

Best regards,
Emanuela Montenegro
CIHEAM Bari team

The reaction of participants to the delivery of the certificate was very positive and many of them expressed their willingness to take part in future online training courses. Some of the comments are reported below.

Pamela Ernstberger EDinAqua	*"Will definitely keep an eye out for the conference next year. Wish you all the best for ongoing project developments and the good work that CIHEAM are doing."*
Miroslav Urošević University of Novi Sad	*"Thank you so much for the kind message with the certificate (incl. all teaching materials)!* *In any case we will keep in touch and hopefully meet personally at the final conference of FutureEUAqua project foreseen on 18th-21st April 2023 (https://futureeuaqua.eu/)"*

Mohammed Rabhi Mostaganem University	*"I was pleased and honoured to attend the online course with your supervising and to meet all different participants from different countries with different experience and knowledge.* *Waiting to meet you in other events, I would to thank you for having us and sharing your experience."*

5. Self-learning course

Material used in both facilitated courses were re-organized to be used in the self-learning course. Material was uploaded on the FutureEUAqua knowledge platform in a space devoted to the self-learning course (https://el.iamb.it/). The course is now open and free for all users. They can easily read and/or download the material. Each presentation provides links to the tools enabling users to read and/or download them and add comments.

Besides, a scientific publication resulted from the online training activities entitled " Peer learning and knowledge co-creation in Organic Aquaculture: The case of FutureEUAqua Project" was accepted for oral presentation for the Agrosym2022 International Symposium (XIII International Agriculture Symposium "AGROSYM 2022" 6-9 October 2022, Bosnia and Herzegovina see page 40 http://agrosym.ues.rs.ba/article/showpdf/program_2022.pdf

6. Annex: Modules description and evaluation

6.1 Module 0: Introductory to e-Learning methodology and process

6.1.1 Rationale

Peer Learning is a form of collaborative instruction that enhances the student/student interaction and leads to positive learning results. In this context, Instructional design is not just concerned with designing and creating teaching material, but it can consistently influence the learning experience. Consequently, with a view to help trainers/educators and tutors to create a highly effective course, it's important to enlighten them about the most relevant instructional design models and strategies to design instructional material. The Module attempted to explain and define the key instructional design models (i.e. ADDIE model) being widely used by educational institutions, academia and universities.

6.1.2 Module objectives

This module's main objective was to give participants insights into the course methodology and the underlying adoption of an appropriate model to create learner-centered teaching material as an instructional designer, in order to make them able to work with subject matter experts/content producer and identify training needs, create engaging learning activities and compelling course content, apply tested instructional design theories, practice, and methods and assess target audience learning performance and evaluate overall online course results.

6.1.3 Module and Tools evaluation

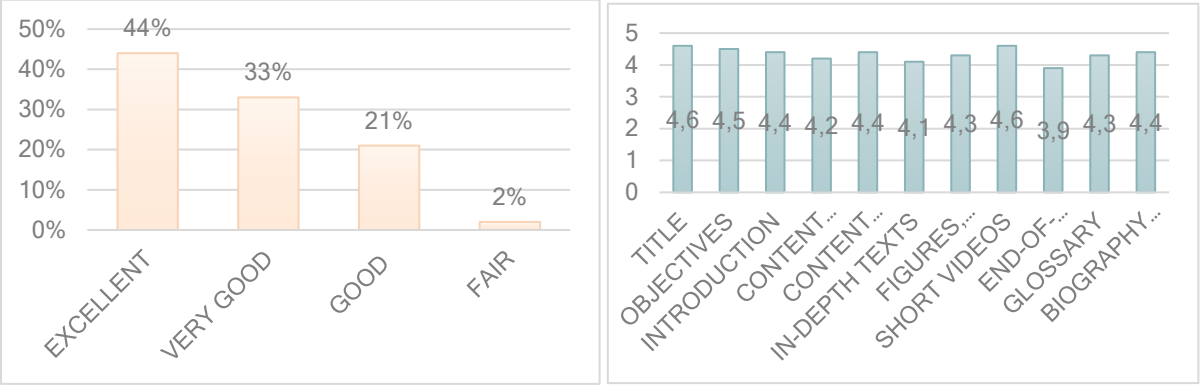


Figure 13 - Module and tool evaluation for M0

Module 0 was evaluated by 17 participants, from whom it received a very positive feedback, with 77% of votes concentrated in the categories 'Excellent' – which gathers almost half of the votes (44%) - and 'Very Good'. Also tools were positively regarded, with 3.9 out of 5 (for the tool 'End-of-module') being the lowest average evaluation and 4.6 (for title and short videos) the highest.

6.1.4 Comments by participants

- *"Record webinar or Zoom for time management"*
- *"I suggest if it is possible organizing training course face to face in order to deal well with tools because in my country we need more practical training due to the Israelian occupation and their control on our sea borders"*
- *"Course need to be more topic specific and advanced like take one branch like fish health and diseases management and talk more about it"*

6.2 Module I: Innovative feeds and feeding strategies for improving welfare & performance of fish in sustainable and organic aquaculture

Link; Module I: Innovative feeds and feeding strategies for improving welfare & performance of fish in sustainable and organic aquaculture

6.2.1 Rationale

This module demonstrates sustainable and resilient nutritional solutions for highest possible fish performance that would be safe for a sustainable aquaculture, by covering innovative, species-specific nutritionally adequate, tailor-made, low ecological footprint fish diets and their nutritional impact on farmed fish growth performance, health and quality. Besides, it shows how the understanding of the impacts of environmental change and human activity on farmed fish can be greatly enhanced by the use of Internet of Things (electronic sensors, etc.), which can significantly improve the knowledge of life traits, such as fish behaviour, condition, physiology and the farming environment.

6.2.2 Module objectives

This module's objective was to give insights into the role of nutritional research in sustainable and organic aquaculture; to make participants comprehend the relationship between innovative fish feeds and nutrition for the production of a healthy fish and how Internet of Things (IoT) can contribute to

precision livestock farming, by enhancing animal welfare, but also production and environmental sustainability; and to explain how the measurement of fish metabolic rates have been proven to be sensitive for monitoring welfare and performance in farmed fish.

6.2.3 Module and Tools evaluation

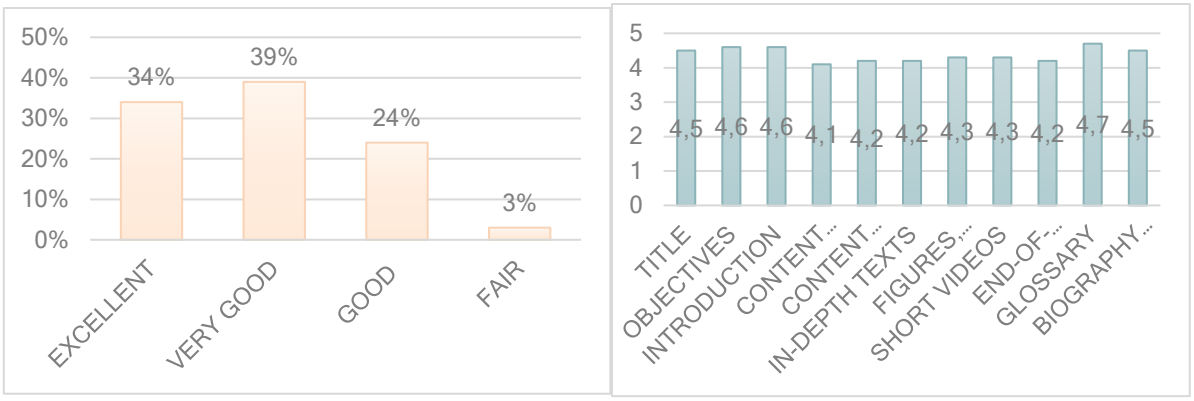


Figure 14 - Module and tool evaluation for M1

Module 1 was evaluated by 34 participants, most of whom considered the learning experience positive. Indeed, 73% of the average overall evaluation of the module fell within the categories 'Excellent' and 'Very good', with 'Very good' collecting the larger share of votes (39%). Tools were positively considered, as they received an average evaluation ranging from 4,1 (Content layout) to 4,7 (Glossary).

6.2.4 Comments by participants

- *"It was an interesting course and for me, with my background in aquaculture and also experience in instructional design, it was good to get insights into the content and the design of the modules delivered in this format. It was good to read about the IoT in session II, addressing solutions for climate change challenges that the industry is facing and will continue to face. I think more detail on the environmental parameters as well as other factors, including more efficient forms of energy or the need to focus on more sustainable seafood-freshwater products: land-based solutions could also be included as these are areas that are currently being tried in many parts and for a range of aquatic organisms."*
- *"I suggest that some live winners are good to increase the interaction among the participants themselves or with the other experts to show the different experiences and discuss deeply."*
- *"There could be less specific and detailed information on sensors, but more information about feeding and feeds."*
- *"Everything about module 1 was perfect, the content structure, relevancy and time allocated. My only problem is those sophisticated tools which I have never seen it like in my country. I will suggest alternative to this tool be stated in future training for the benefits of most Africans."*
- *"The module was excellent however I suggest to record vocal explanations for the hard slides."*
- *"Content: The topics of the different modules are totally different. It was interesting to learn and to know the existing internet things, as I was not aware of these possibilities, although I had other expectations of the content of the course. (I expected more content on the aquaculture production itself as I'm not already fully acquainted with aquaculture). But*

anyway a new world opened. (and for me, I had to read the courses more than once, to fully understand as it was all new to me).”

6.3 Module II: Consumer perception and preferences

Link; Module II: Consumer perception and preferences

6.3.1 Rationale

For the development of an effective communication campaign to raise awareness on sustainable agriculture it is important to identify the preferences and the perception of consumers on information regarding sustainable agriculture in Europe, which can be done through information experiments, e.g., on social media, to be designed to fit the goals of the campaign and use the information from the experiments to develop constructive guidelines for the communication campaign.

6.3.2 Module objectives

The aim of this module was to make participants understand how consumers respond to information about sustainable aquaculture production methods in Europe and give them tools to apply knowledge on consumer reactions to practical guidelines for a marketing communication campaign.

6.3.3 Module and Tools evaluation

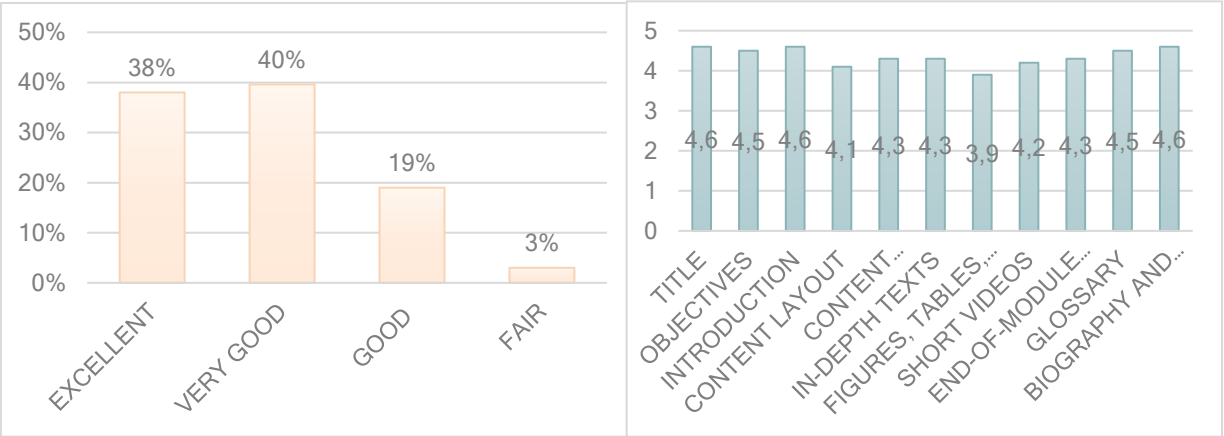


Figure 15 - Module and tool evaluation for M2

Module 2 was evaluated by 28 participants, who mainly considered the module very positive. The 78% of votes, indeed, concentrated in the best categories in terms of positiveness of the experience, i.e. Excellent and Very good, collecting each more than 1/3 of the evaluations. Tools were positively evaluated with the lowest average evaluation going to Figures, tables, schemes or diagrams (3,9/5) and the highest to Title, Introduction and Biography and linkography (4,6/5 each).

6.3.4 Comments by participants

- *“I think Consumer Perception is an area that needs a lot more focus, as these are the driving forces behind all food production. During these times, the aquaculture sector has a strong foothold to make a positive impact on seafood production and demonstrating through transparency and communication efforts that it is meeting the challenges of food security and also taking into account key SDG targets for 2030”*
- *“I think that providing videos will be more helpful”*

- *"Improving the use of the website"*
- *"Everything about module 2 was perfect; the content structure, relevancy and time allocated."*
- *"I wish there was more details that explains more how to choose the target groups and formulate the advertisement and posts on social media"*
- *"Module II: consumer perception and preferences: I think the 'conclusion' of the survey is probably the reality. If I would have to summarise the findings: I would consider that consumers just trust 'emotional' statements, without proof. For me that is a danger. As using 'emotional' elements, without real evidence, content, is just a buble that can "be pierced" easily. A message like 'making sure that we and our children can enjoy tasty and healthy fish in the future' is for me a nonsense statement, without real content. (but that is just my opinion, and for this, that can be a reason not to chose for aquaculture, because I do not get clear information about aquaculture, and aquaculture also has a negative image concerning animal welfare and feeding, and veterinary aspects, and this emotional statement does not change this). Good to see that from the survey, there are differences between countries. So it also depends on the country, age of people etc."*

6.4 Module III - Regulatory framework of aquaculture in the EU, with special focus on organic aquaculture.

Link; Module III - Regulatory framework of aquaculture in the EU, with special focus on organic aquaculture.

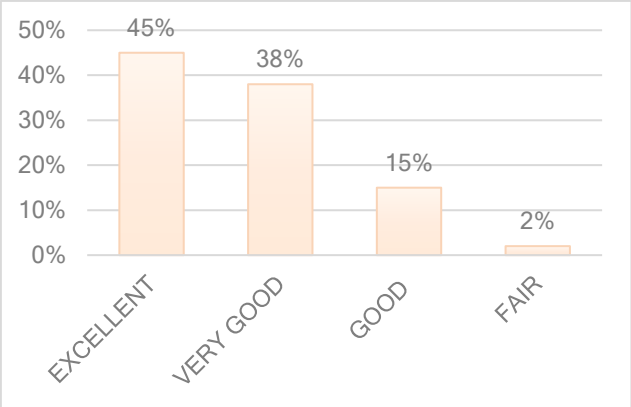
6.4.1 Rationale

Teach aquaculture stakeholders about the most relevant aspects of EU policy on aquaculture, and specifically about the requirements of the EU Organic Regulation in context with organic aquaculture production

6.4.2 Module objectives

The aim of this module was to make participants understand how consumers respond to information about sustainable aquaculture production methods in Europe and give them tools to apply knowledge on consumer reactions to practical guidelines for a marketing communication campaign.

6.4.3 Module and Tools evaluation



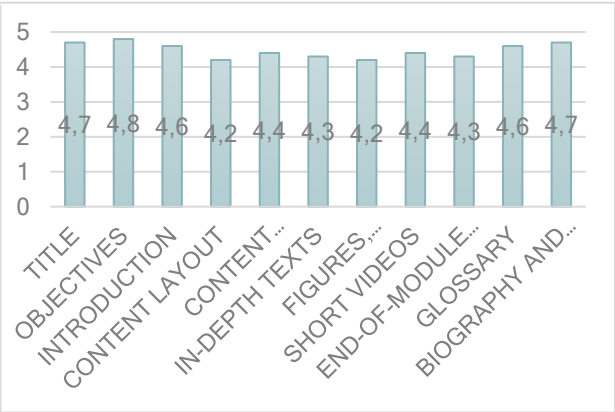


Figure 16 - Module and tool evaluation for M3

With 25 participants evaluating it, Module 3 received very positive feedback with almost half of the average evaluations falling under the category 'Excellent' alone (45%) and 38% of votes going to 'Very good'. Module 3 tools received the highest average evaluations of all modules, with objectives receiving an evaluation of 4,8 and content layout being the lowest evaluated tool with 4,2.

6.4.4 Comments by participants

- *"For me it really helped to get a better understanding of the regulations for organic aquaculture in the EU (Module III). Would be good to include some multimedia to break up the text, for example, a video showcasing a well-stocked farm or RAS vs a high density set up."*
- *"This type of training recognises that the sustainable development of aquaculture is based on certain principles of biodiversity conservation and sustainable use of inputs and resources including food and medicine, and I suggest that these trainings should be continued but with a single focus in order to deepen the knowledge and skills to ensure the sustainability of the aquaculture sector necessary for food security."*
- *"Everything about module 3 was just great! the content structure, relevancy and time allocated. The materials is perfect but for the benefit of all especially new graduate and none-EU participant those regulations herein should be clearly stated. Reference to figures and date should be avoided to make the material more clear. Thank CIHEAM BARI I really learn a lot."*
- *"EU policies on aquaculture (regulations, guidelines, and collaborative arrangements) are not comparable when it comes to the African continent because of territorial area disputes between the countries within Africa. In addition I do believe the African countries can learn a lot from the organic Aquaculture policies."*
- *"As I mentioned before I hope in the next time the module include live lecture for more interaction among the participants and the experts also to exchange the information and experiences about proposed topic."*

6.5 Module IV: Recovery and final synthesis

6.5.1 Rationale

This module represented the overall synthesis and recovery of information provided in previous modules, with particular focus on target audience's opinion on topics covered.

6.5.2 Module objectives

The module was aimed at giving participants the chance to study and complete activities of unread modules; complete self-evaluation tests; fill out the evaluation forms you have not completed yet; give feedback about the entire Training course.

7. Concluding remarks

Overall, the evaluations expressed show that the course was successful and positively received by participants. Yet, some challenges experienced by the instructional team and participants need to be pointed out. CIHEAM Bari, as the instructional design team, reported that (a) a greater availability of human resources would have been useful for the building-up of the course; (b) the platform used need to be updated for future courses delivered so as to include functionalities, such as notices sent via email to participants when a new forum discussion is opened; (c) the period of course delivery coincided with the summer holidays of many of the registered participants, which contributed to the dropout phenomenon recorded; (d) being overloaded, most instructors could not dedicate enough time to animate and feed the forum discussion. From their side, participants suggested that, with a view to a greater effectiveness of the course, also other channels or tools should be used for the course delivery and participants interactions, such as Zoom meetings, webinars, recorded explanations or more videos about the analysed topics, social media, etc. A share of participants also suggested that the course should focus on fewer aspects or on a single topic to be able to have a deeper knowledge on fewer aspects rather than a more general smattering on a larger number of topics. To conclude, many participants experienced some difficulties with the use of digital tools or certain functionalities of the platform.

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