

Spain - Acuaponic project

Title of inspiring practice	Acuaponic project (<i>"Proyecto Acuaponia Tknika"</i>)
Geographical area	Basque Country
Period of implementation	The project started in September 2018 and has no end date.
Rationale	<p>Aquaponics combines hydroponics with aquaculture in order to produce fish and vegetables in a recirculation system. The wastewater left over from the fish production tanks is used as a source of nutrients for plants, which, in turn, act as biological filters, cleaning the water returning to the tanks. This in turn keeps the system in balance, ensuring proper water quality. The Acuaponic project is structured as the focal point for this productive technology in the Basque Country Autonomous Community, with the aim of building the Basque technical aquaculture sector and supply the markets with new quality products.</p> <p>This practice is an example for others because we have learnedt more about aquaculture and the recirculation system.</p>
Scope of the practice	The project develops innovations in the field of aquaponic crops for the entire vocational training system of the Basque Country and its partners.
Educational level	Levels 4A and 5 of EQF
Introduction and context	<p>The main promoter of the initiative is Tknika (Basque VET Applied Research Centre).</p> <p>The project can count on the partnership with vocational training centres in agricultural and maritime fishing specialties and involves the participation of teachers from schools specialising in maritime fisheries and the primary sector.</p> <p>The direct beneficiaries of the project are the vocational training centres of the participating professional families, the future professionals of the maritime fishing sector or the primary sector in general and the agri-food industries that benefit from the innovations and new applied production techniques. The society in general also benefits from this project through the increased commitment to circularity and sustainability incorporated into the education and production system.</p> <p>Aquaponics is the solution to the problem of food insecurity, the lack of water for fish farming and the agricultural sector and the solution for the exploitation of arid areas through the cultivation of species in this type of biotechnology.</p> <p>The objective of the practice is to investigate more in new aquaponics and agricultural systems, based on sustainability and the optimization of water resources. This is very important due to the lack of water we are suffering.</p>
Key activities and outcomes	<p>Aquaponics helps improving water reuse, maximising efficiency in the use of productive space and productivity, ensuring the complete traceability of the system, improving the productivity of certain plant species and the diversification of production with fish species. The aquaponic system is also more efficient than those of conventional fish farms, as it provides a higher quality product, and diversifies the end result with vegetables.</p> <p>Aquaponics is the system by which plants and fish are produced in a sustainable way. Aquaculture combines traditional aquaculture, which is the farming of aquatic animals, with hydroponics, the cultivation of plants without soil, in a closed cycle. In aquaculture, the secretions of the farmed animals can accumulate in the water, increasing its toxicity; in contrast, in an aquaponics system, the aquaculture water, which here functions as a subsystem, feeds the hydroponic system, in which the waste is broken down into nitrites and then into nitrates by nitrification bacteria. These nitrates are then used by the plants</p>

	<p>as nutrients, so it is possible for the water to return to the aquaculture subsystem. Aquaponics is part of the circular economy experiences and in this case, the BioTknifish project will be transferred.</p> <p>Aquacultural production can be used for food, medicinal purposes and, in the case of crab, for the restocking of endangered species, such as the Tilapia, Carps, Sturgeons, Zebrafish, Tench, Crayfish, Rainbow trout.</p> <p>Vegetable production includes Batavia saturdai lettuce (purple), Batavia tourbillon lettuce (green), Cherry tomato, Strawberry Charlotte, Bananas. This year, the Chinese cabbage Pak tsoi, the Chinese vegetables Tatsoi, Green kale and purple kale, the sweet tomato for desserts Physalis, Spinach, Raspberry growing Cherry tomato in red or various colours, Physalis of various colours were introduced in the production, together with Edible flowers such as tagetes, basil and nasturtium, violas. A list with photographs is attached and shows a pictogram indicating whether it is the fruit or the leaf that is consumed.</p> <p>These systems are scarce due to the high initial cost of implementation and the lack of preparation and training of farmers to carry out this type of production. As a result, they are being used more in universities for research. Even so, there are many notable water gardens in Hawaii and New York, where they are proving to be very successful as marketing strategies for restaurants and organic food shops.</p> <p>Tknika designed and offered a 20-hour introductory course on aquaponics. The main objective was to transfer part of the knowledge acquired in the course of the aquaponic project to the VET teachers at schools. The course started by explaining the main parts of the aquaponic model and the history of aquaponics. In the following classes the important parts were explained: plants, fish, water quality and installations.</p> <p>We have achieved different goals, some of which are the creation of new production models, the development of precision agriculture and implementation of automation in the primary sector and also technicians formed in aquaponics.</p> <p>Important factors that have contributed to the success of the initiative are the commitment to the project, teamwork, the collaboration with diverse companies and also the assigned budget. These factors have all been essential to carrying out the project.</p>
<p>Other information</p>	<p>The Acuaponic project is an initiative promoted by Tknika (centre for applied innovation in vocational training in the Basque Country) whose mission is to promote innovation projects within the Basque vocational training system in order to carry out applied research in the different professional families. It also aims at transferring the knowledge generated both to the centres and to the teaching staff through dissemination and transfer actions. On the other hand, the ultimate aim of the project is to apply these new agricultural production systems to the real production system. To this end, Tknika uses a network of public-private collaboration between the different vocational training centres in the Basque Country, to which it provides support and advice so that the project can grow and be implemented in the real market.</p>
<p>Contacts and sources</p>	<p>Tknika (Basque VET Applied Research Centre) www.tknika.eus</p> <p>Video presentation: https://youtu.be/7iORPTf55_c</p> <p>Additional resources: https://tknika.eus/cont/proyectos/biotknifish/ https://tknika.eus/en/cont/proyectos/biotknifish-3/</p>
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