FISH
Fertilizzante Idrolizzato Suolo e Habitat

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(SENSORY TESTS)

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(CIRCULAR BUSINESS MODEL)

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The Project

It is aimed at the study of an innovative hydrolyzed product derived from **fishery by-products** and its effects on soil and plants

Goal

The introduction and dissemination in the main Ligurian crops of an innovative biostimulating product obtained from **by-products of the local fishing chain**

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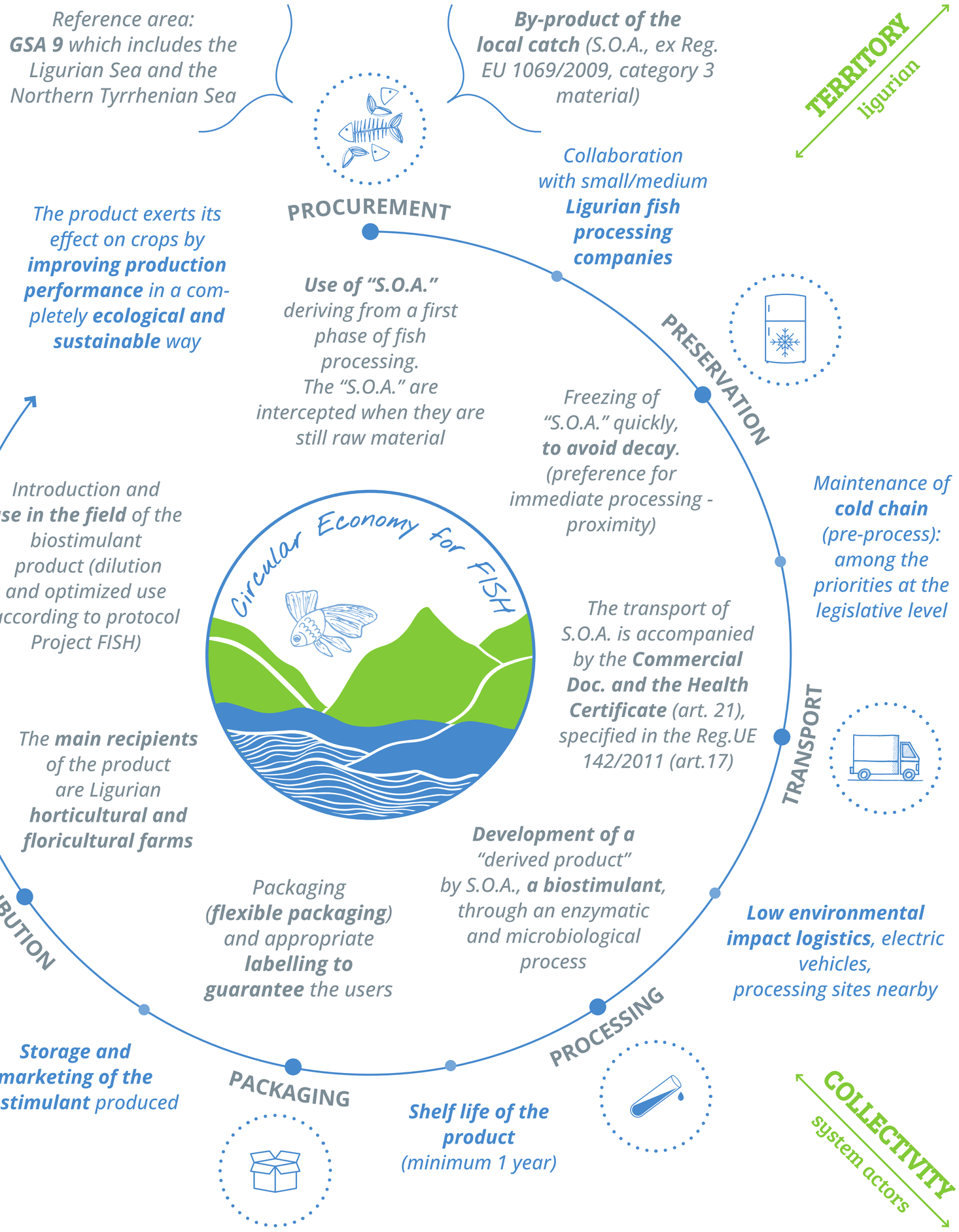
REGIONE LIGURIA

A hypothesis of circular business model

Focus on the systemic and circular approach of the project



Sensory tests and Results

3 different sessions from October 2021 to July 2022. **5 horticultural crops** treated with different formulations of experimental biostimulants.

Subjects were asked to rate how much they **disliked/liked** the sample **in terms of appearance**, **odour**, **taste**, **texture**, **flavour**, and **overall liking** on a 9-point hedonic scale (1=extremely dislike; 9=extremely like).

Liking mean values (± standard deviation) of two samples of tomatoes_Session 1

Pink beefsteak tomato treated with biostimulant FISH 7 obtained significantly higher scores for flavour and texture.

Attribute	*Tomatoes treated with Fish-7*	*Tomatoes not treated*	*p- value*
Appearance	6,9 ± 1,6	6,9 ± 1,4	1,000
Odour	6,7 ± 1,6	6,7 ± 1,7	0,927
Taste	6,3 ± 1,7	5,8 ± 1,9	0,081
Flavour	**6,3 ± 1,7**	**5,7 ± 1,8**	**0,028**
Texture	**6,5 ± 1,9**	**5,8 ± 1,8**	**0,020**
Overall Liking	6,6 ± 1,7	6,1 ± 1,6	0,083

Session 1

Liking test on Tomatoes and Basil 89 subjects 60.7 % female 39.3 % male

Liking mean values of five samples of basil_Session 2

Significant differences were observed for all attributes. Specifically, basil treated with biostimulant Test 2 IDF 10.2 ml obtained lower liking scores for all sensory attributes analyzed.

Attribute	*Basil not treated*	*Basil treated with Test 1 D 6.7 ml*	*Basil treated with Test 2 IDF 10.2 ml*	*Basil treated with Test 3 IDB 10.2 ml*	*Basil treated with Test 4 IDF B 5.6 ml*	*p-value*
Appearance	**6.5^{a}**	**6.3^{a}**	**5.4^{b}**	**6.1^{a}**	**6.2^{a}**	**0.0002**
Odour	**5.8^{a}**	**5.5^{ab}**	**4.4^{c}**	**4.7^{bc}**	**4.9^{abc}**	**0.0001**
Taste	**5.4^{a}**	**5.2^{ab}**	**4.5^{b}**	**5.1^{ab}**	**4.8^{ab}**	**0.031**
Flavour	**5.4^{a}**	**5.3^{ab}**	**4.5^{b}**	**5.1^{ab}**	**4.8^{ab}**	**0.018**
Texture	**6.3^{a}**	**6.0^{a}**	**5.2^{b}**	**5.9^{a}**	**6.^{0a}**	**0.0004**
Overall Liking	**5.7^{a}**	**5.4^{ab}**	**4.8^{b}**	**5.3^{ab}**	**5.3^{ab}**	**0.030**

Session 2

Liking test on Garlic and Basil 60 subjects 58.3 % female 41.7 % male

Basil analyzed in *session 1* exhibited no significant differences *($p > 0.05$)*. For **garlic** *(session 2)* and **zucchini** *(session 3)*, the only attribute significantly affected by the treatment was appearance *($p=0.008$; $p < 0.0001$)*. Finally, **tomatoes** *(session 3)* were notably different in terms of appearance *($p=0.0004$)* and odour *($p=0.002$)*.

Liking mean values (± standard deviation) of two samples of onions_Session 3

Significant differences were observed in the perception of taste, flavour and overall liking. Specifically, for these sensory attributes, the onion treated with biostimulant IF 13 had lower liking scores than onion not treated with any biostimulant.

Attribute	*Onion treated with IF13*	*Onion not treated*	*p-value*
Appearance	6.5±1.5	6.5±1.6	0.845
Odour	6.1±1.9	6.5±1.9	0.330
Taste	**5.1±2.1**	**6.2±1.7**	**0.006**
Flavour	**4.9±2.2**	**6.2±1.6**	**0.001**
Texture	5.6±1.9	6.3±1.4	0.067
Overall Liking	**5.3±2.0**	**6.4±1.6**	**0.004**

Session 3

Liking test on Tomatoes, Onions and Zucchini 48 subjects 62.5 % female 37.5 % male