

TOOLS, MODELS AND DECISION SUPPORT SYSTEMS FOR POLICY AND GOVERNANCE: THE 'TAPAS' PROJECT

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Tools for Assessment and Planning of Aquaculture Sustainability



- **University of Stirling** (UK) (coordinator)
- **NIVA** (Norway)
- **DHI** (Denmark)
- **Water Insight BV** (Netherlands)
- **Alterra-Wageningen UR** (Netherlands)
- **Plymouth Marine Laboratory** (UK)
- **Universidad de Murcia** (Spain)
- **Université de Nantes** (France)
- **Hellenic Centre for Marine Research** (Greece)
- **Szent Istvan University** (Hungary)
- **AquaBioTech Group Ltd** (Malta)
- **Marine Institute** (Ireland)
- **NACEE – Eastern European** (Hungary)
- **Aquaculture Stewardship Council** (UK)
- **Fundacion Imdea Aqua** (Spain)

Background – Aquaculture in Europe



Background – Aquaculture in Europe

- EU aquaculture produces 1.3 million tonnes worth EUR 4 billion
- EU aquaculture provides jobs for 39 000 people
- Trends overall: volume stable, but value slowly increasing

	2008		2015	
	Aquaculture production (tonnes)	Share of total fisheries (%)	Aquaculture production (tonnes)	Share of total fisheries (%)
EU-28	1 271 671	20.6	1 259 833	19.7
Belgium	126	0.6	32	0.1
Bulgaria	7 251	48.6	10 652	54.9
Czech Republic	20 395	100.0	20 200	100.0
Denmark	37 216	5.1	35 990	4.0
Germany	43 977	17.5	26 867	9.7
Estonia	475	0.5	798	1.1
Ireland	44 871	17.9	37 581	13.8
Greece	114 888	57.8	105 934	62.2
Spain	252 238	22.8	293 510	24.6
France	238 249	32.7	163 304	24.7
Croatia	16 387	25.1	16 875	18.9
Italy	157 865	40.5	148 139	43.6
Cyprus	3 776	65.5	5 459	78.7
Latvia	583	0.4	863	1.1
Lithuania	3 008	1.9	4 083	5.3
Luxembourg	0	0.0	0	0.0
Hungary	15 000	100.0	17 337	100.0
Malta	6 727	84.0	10 800	81.6
Netherlands	46 621	11.0	62 204	14.6
Austria	2 087	100.0	3 503	100.0
Poland	36 813	24.2	33 560	15.2
Portugal	7 352	3.2	9 563	4.9
Romania	12 496	96.6	11 016	69.5
Slovenia	1 315	64.4	1 590	89.3
Slovakia	1 078	100.0	1 248	100.0
Finland	13 439	10.1	14 879	8.8
Sweden	7 596	3.2	12 277	5.7
United Kingdom	179 843	23.4	211 568	23.2
Iceland	5 088	0.4	8 382	0.6
Norway	848 406	26.4	1 380 838	39.2
Turkey	:	:	238 624	37.5

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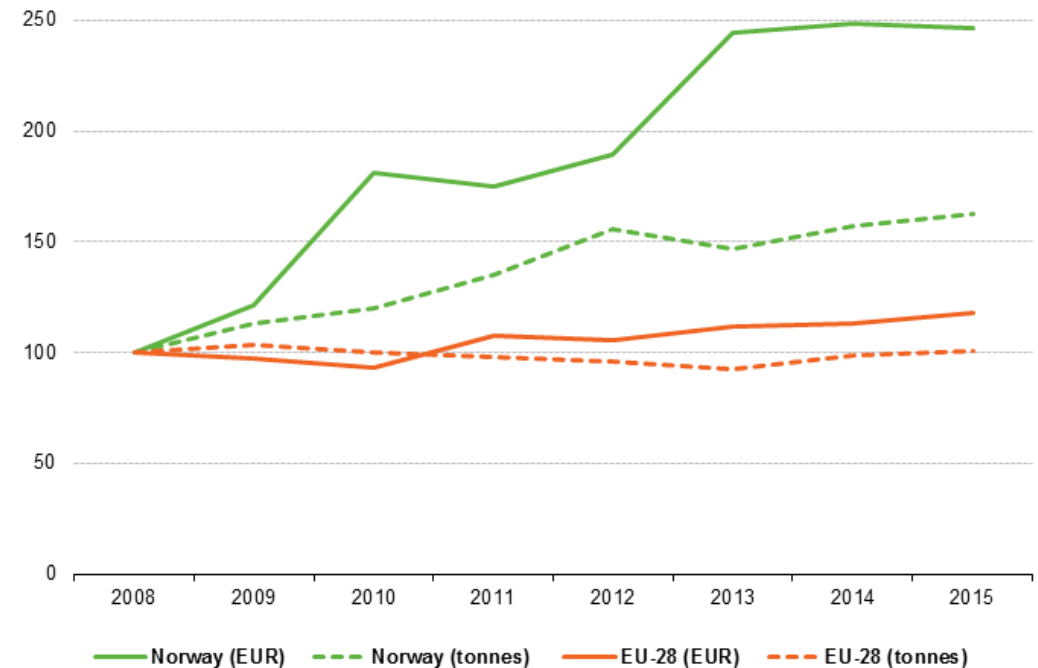
	2008	2015
	EUR (million)	EUR (million)
EU-28	3 437	4 128
Belgium	0.7	0.3
Bulgaria	16.5	22.8
Czech Republic	41.5	35.0
Denmark	98.3	109.5
Germany	97.1	109.3
Estonia	1.8	3.4
Ireland	92.4	136.5
Greece	369.9	463.4
Spain	410.8	513.4
France	691.6	620.0
Croatia	:	102.7
Italy	465.6	437.2
Cyprus	33.1	32.3
Latvia	1.5	2.4
Lithuania	6.6	9.3
Luxembourg	0.0	0.0
Hungary	30.4	30.6
Malta	93.8	127.9
Netherlands	96.6	94.7
Austria	12.7	19.8
Poland	73.3	86.6
Portugal	40.2	54.2
Romania	18.1	21.8
Slovenia	3.5	4.0
Slovakia	2.7	3.6
Finland	36.8	49.4
Sweden	23.2	43.1
United Kingdom	678.5	995.3
Iceland	15.6	0.0
Norway	2 123.3	5 236.4
Turkey	:	824.6

(:) not available

Eurostat, 2017

Background – Aquaculture in Europe

- Trends overall: volume stable, but value slowly increasing?
- But compare this to the Norwegian aquaculture sector?
- **Why?**
- One of the key “bottlenecks” is regulation, licensing and governance of aquaculture

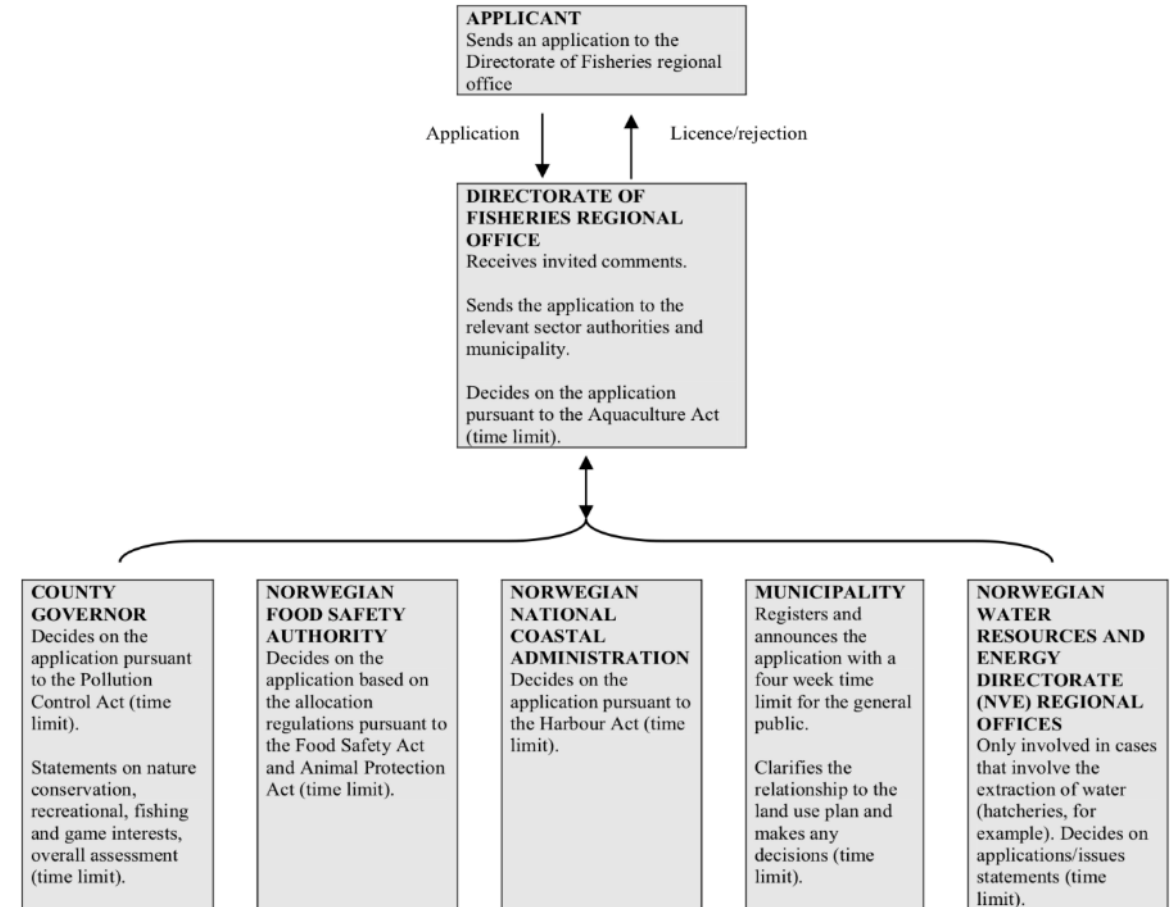


Note: 2015 figures for EU -28 aquaculture production in volume and in value are estimated by Eurostat

Eurostat, 2017

Examples of application

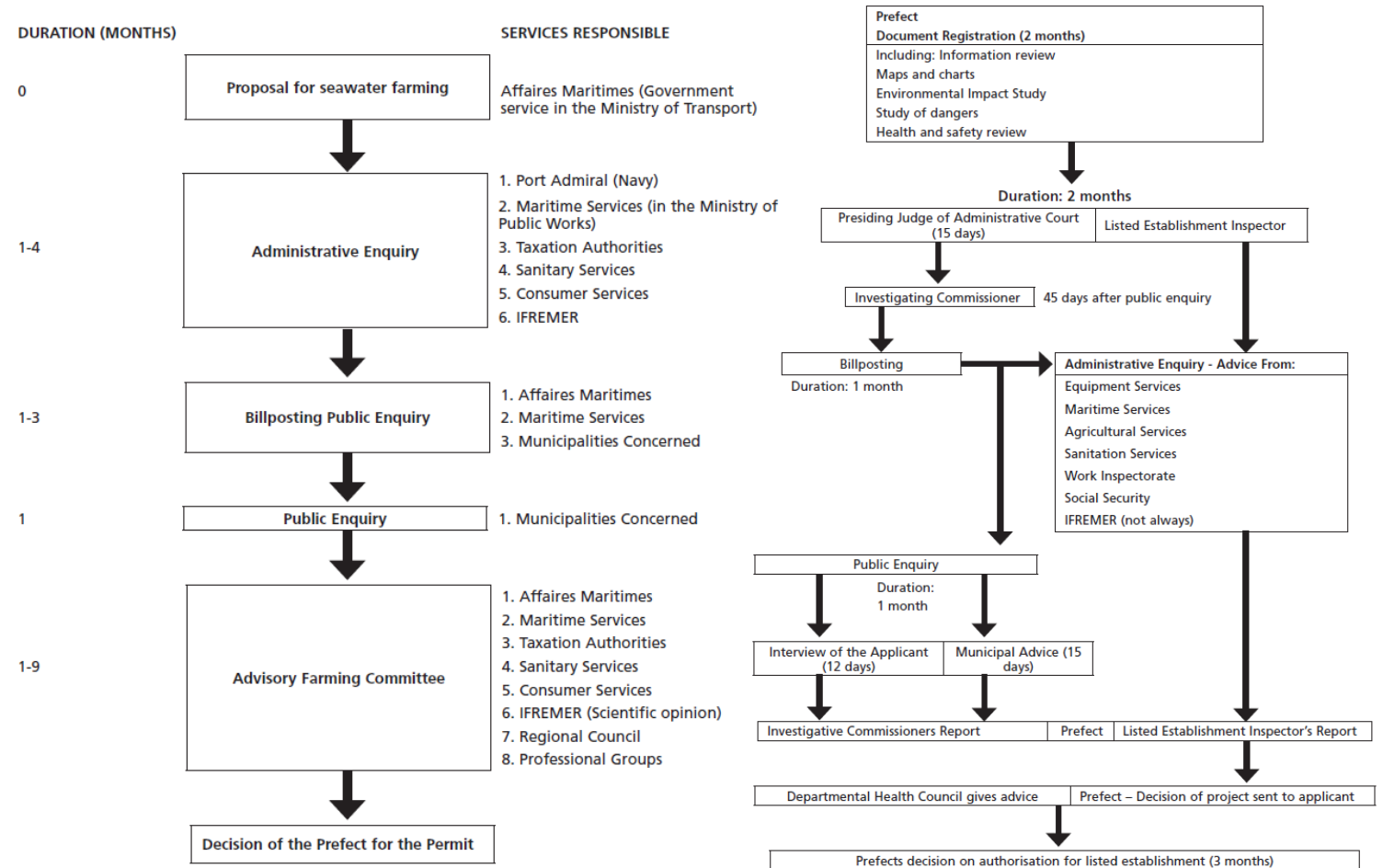
- One-stop-shop system with a time limit of 22 weeks per application.
- MAB of 780 tonnes/licence within regions 1-9. Regions 10-13 have MAB of 945 tonnes/licence due to reduced growth.
- One licence can be used to operate up to 4 farm sites; farms exceeding MAB can utilise up to six licences within one given farm site.
- Under review – Traffic light system based on wild fish interaction for designation of licensing. Extending



Norwegian Ministry of Fisheries and Coastal Affairs, 2005.

Examples of application

- Mainly shellfish. Fish key for expansion
- Different concessions (private or state owned land/sea area)
- Large number of consultees at each stage
- Granted for 35 years
- One license for new farm granted in 25 years



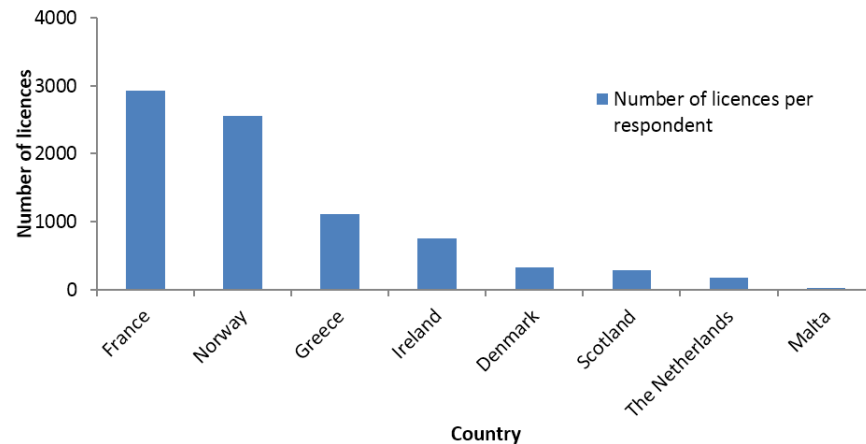
FAO, 2009

Bottlenecks vary?

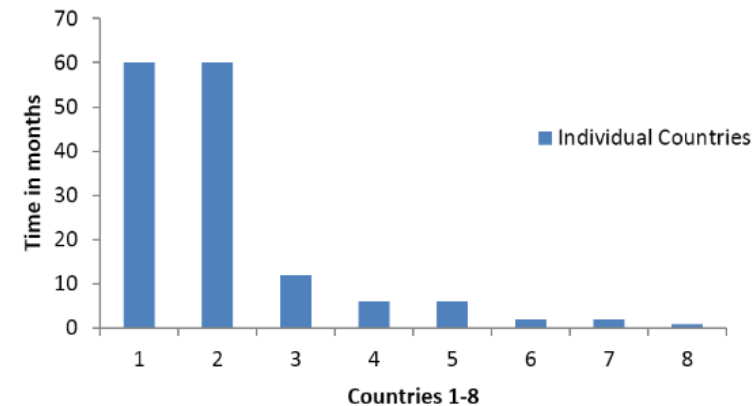
So for licensing and regulation:

- Variable practices
- Varying efficiencies
- Varying expertise

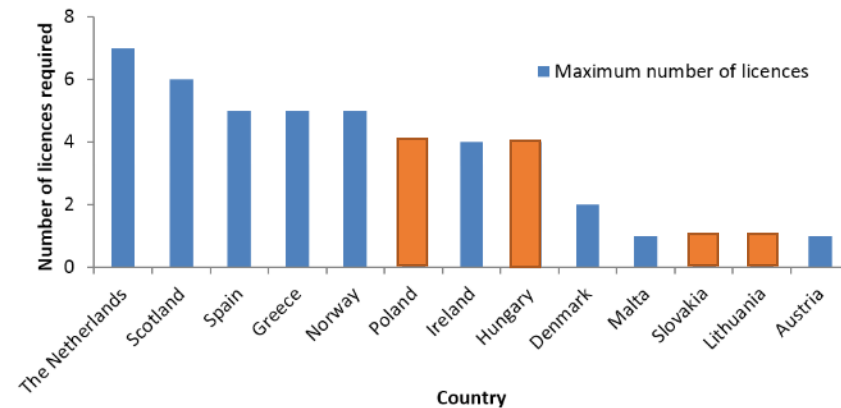
Approx. Number of Extant Licences



Processing Time for Licence Application



Maximum Number of Licences required



TAPAS, 2017

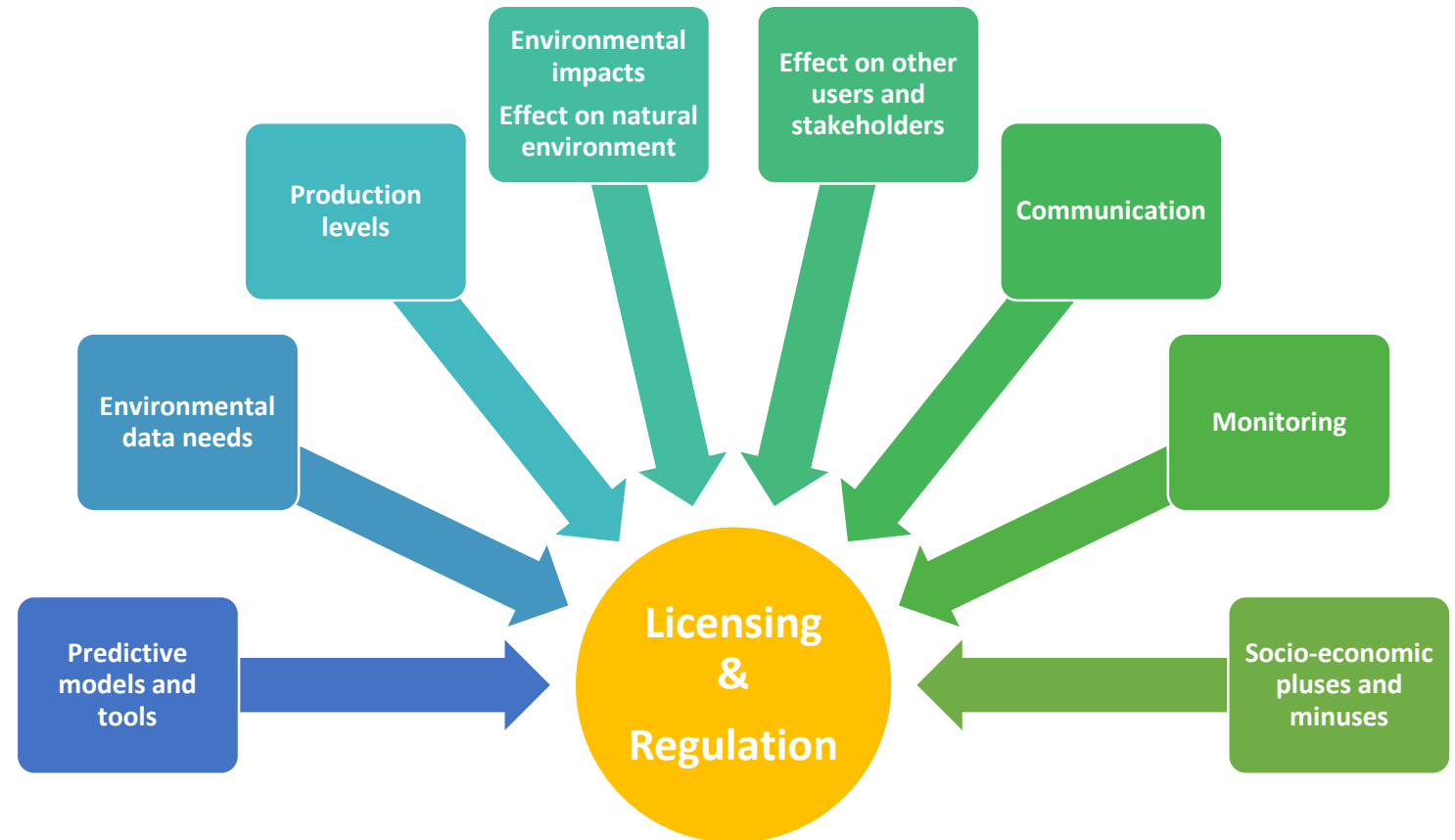
So - the challenges?

- **Fragmented approaches to licensing and regulation**, together with limited availability of suitable areas for aquaculture, are a major barrier to future development and expansion of the aquaculture sector.
- There is a **need to support countries to establish more efficient regulatory frameworks** and to reduce cost and time of licensing aquaculture farms.
- There is a **need to ensure there are appropriate tools, models and approaches** available to predict and monitor environmental impacts and also quantify ecosystem services provided by aquaculture.
- There is a **need to strengthen environmental sustainability of aquaculture and enhance aquaculture's image**.

Requirements for decision making?

But what is needed for this to be effective?

- Do these mechanisms exist?
- Does the information exist?
- Are they implemented and how?
- Can there be a consistent policy?
- Are there consistent methods?
- **Need for Decision Support Toolbox**

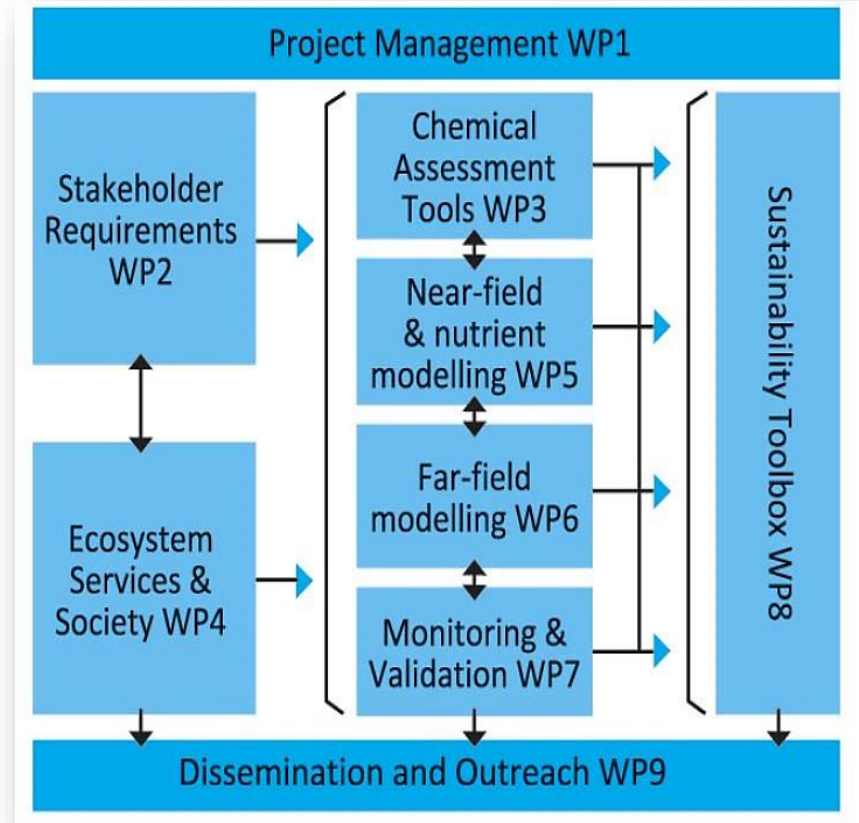


Aims and objectives

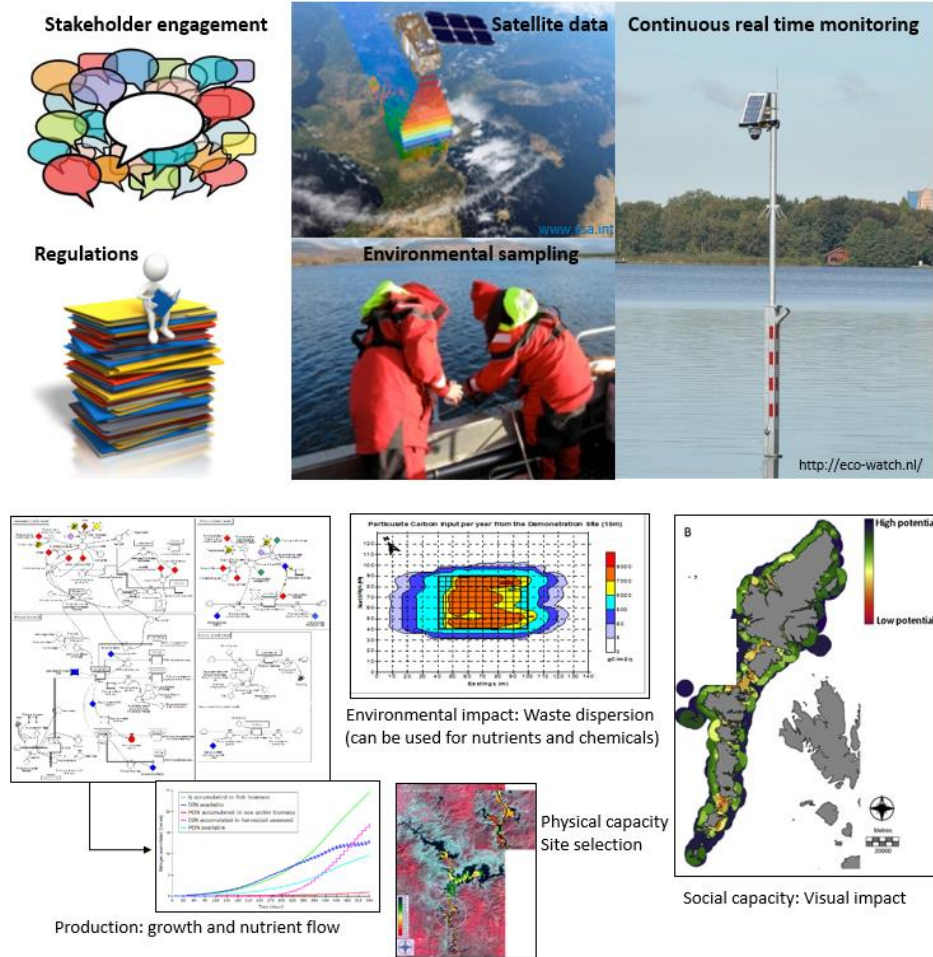
- Identify sustainability requirements and licensing approaches, and identify bottlenecks hampering cost-efficient licensing and regulatory practices.
- Identify the gap between the availability of and needs for models, modelling and decision frameworks, and critically analyse and refine existing tools and technologies, developing new approaches if needed.
- Assess the environmental services provided by European aquaculture
- Strengthen management practices and develop an **Aquaculture Sustainability Toolbox** for timely and cost-efficient environmental assessment and regulation

The TAPAS Project interactions

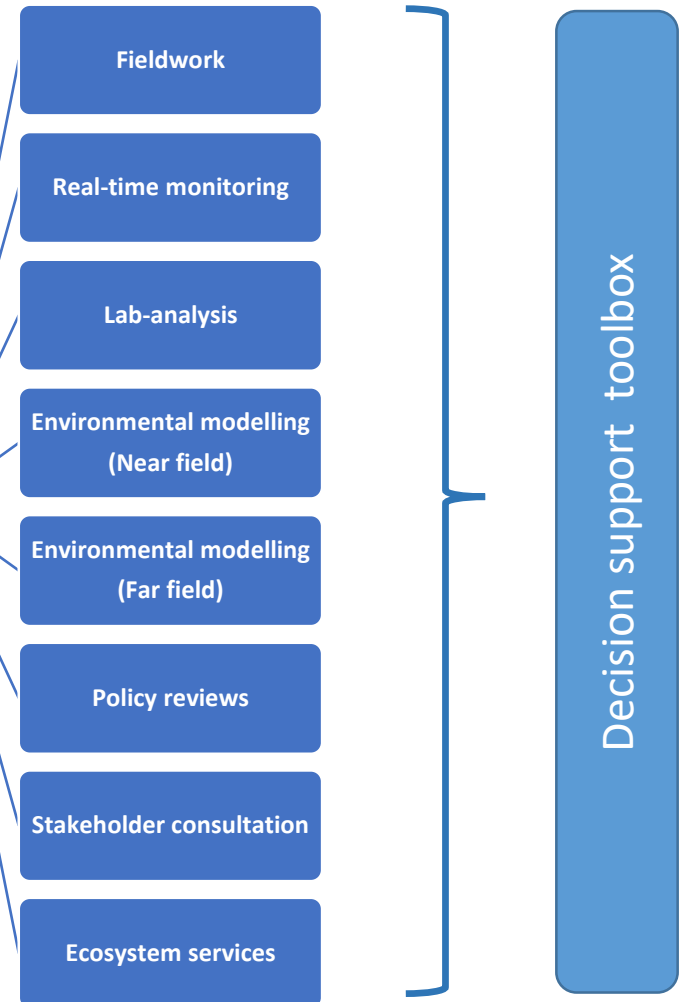
- **WP1** – Project management (*UOS*)
- **WP2** - Requirements Analysis and Stakeholder Integration (*MI*)
- **WP3** - Environmental Risk Assessment of potentially toxic substances (*ALT*)
- **WP4** - Ecosystem Services and Societal models (*NIVA*)
- **WP5** - Near Field Models for regulation and site selection (*UOS*)
- **WP6** - Far Field Models (*PML*)
- **WP7** - Monitoring and Validation (*WI*)
- **WP8** - Aquaculture Sustainability Toolbox (*DHI*)
- **WP9** - Dissemination, Outreach and Exploitation (*ABT*)



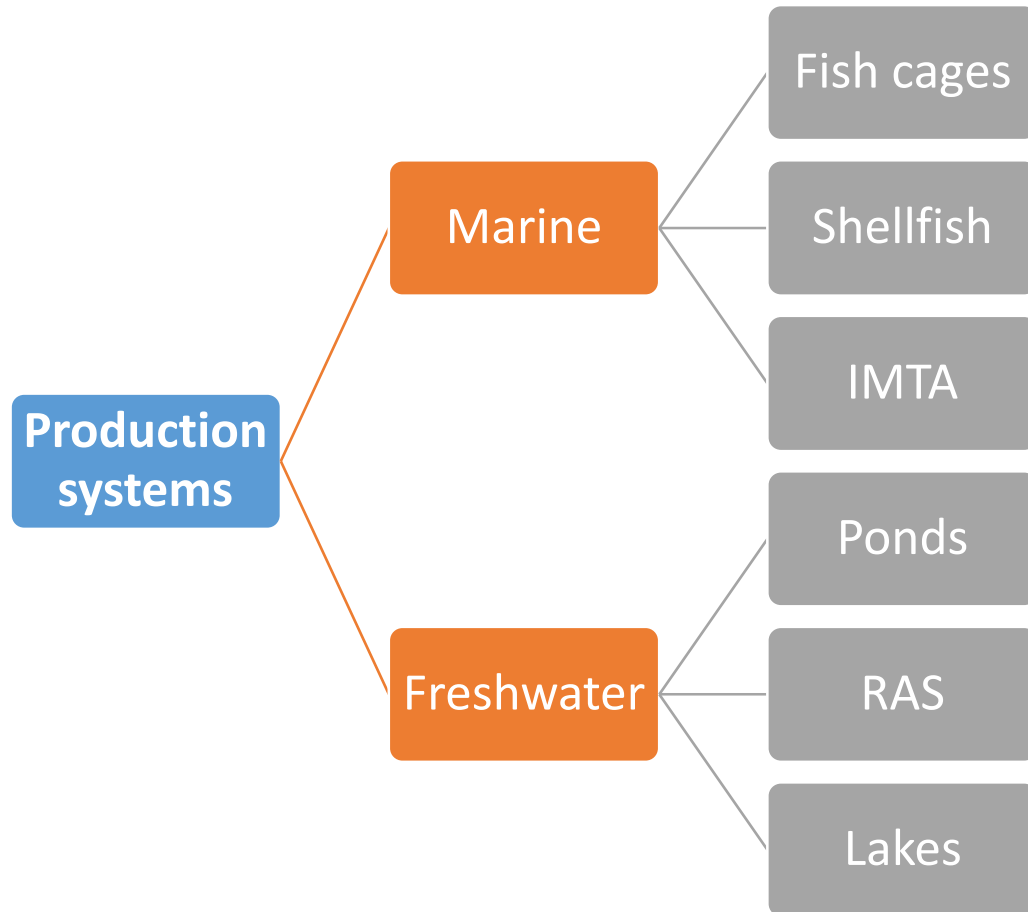
The TAPAS Project interactions



Strengthened Approaches



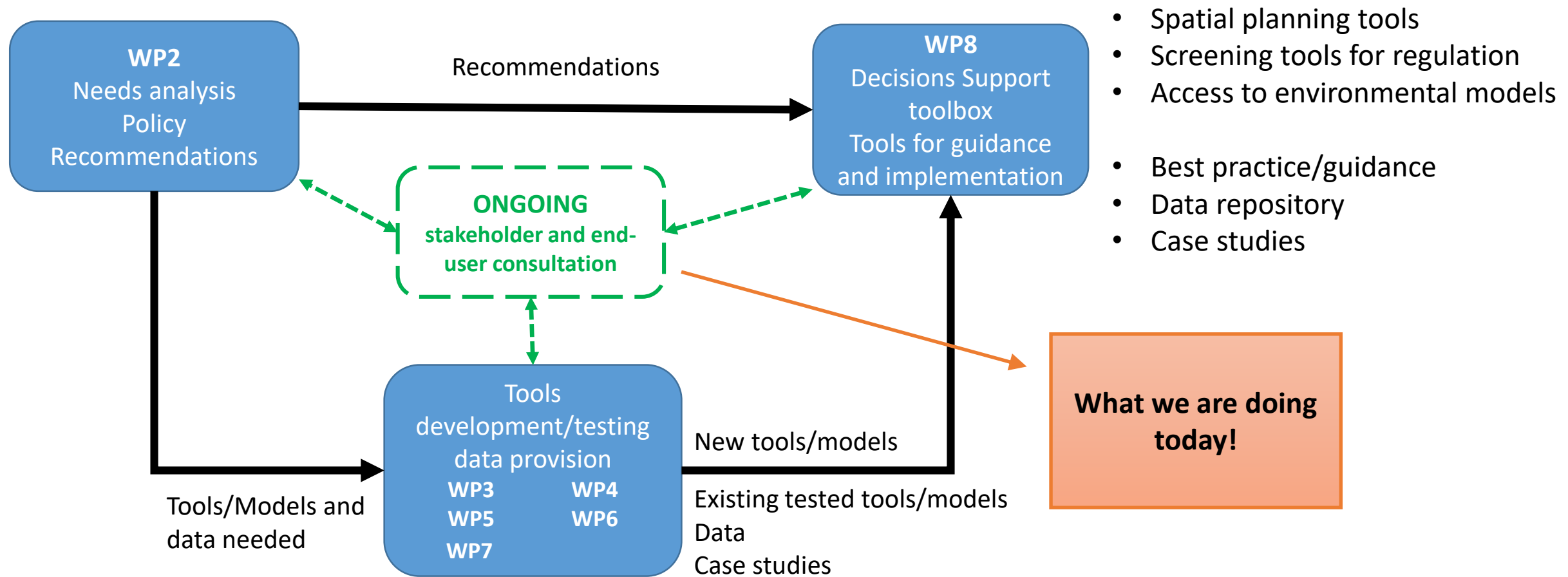
The TAPAS Project interactions



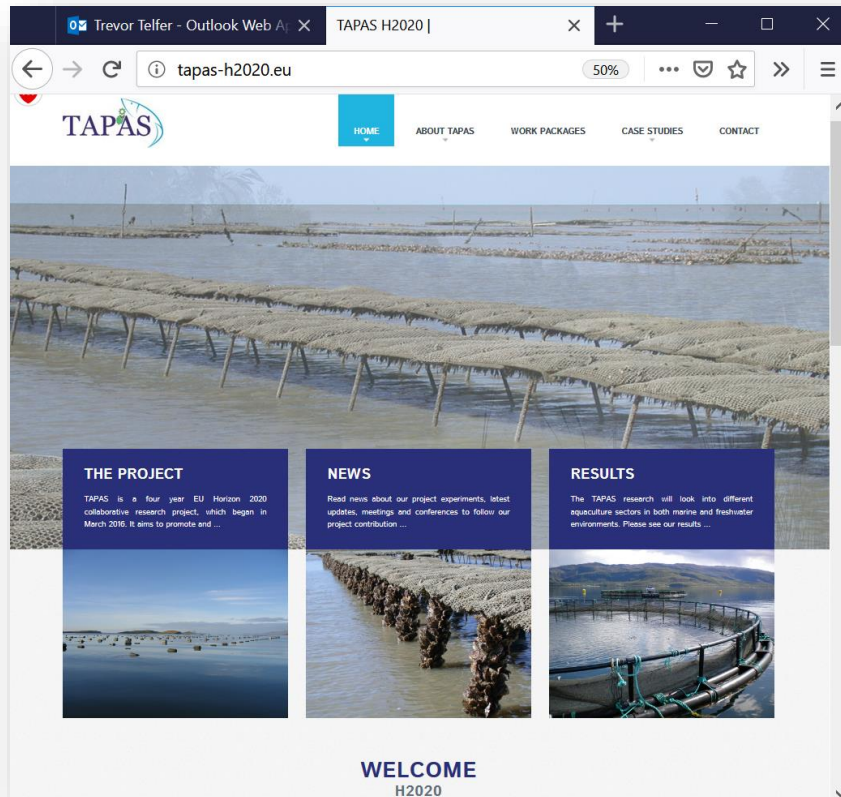
Case studies



Aquaculture Sustainability Toolbox



Communication and information



<http://tapas-h2020.eu/>



https://twitter.com/tapas_h2020?lang=en

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