

AMU monitoring in aquaculture at field level

Workshop on enhancing aquatic animal health and biosecurity

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Dr Dante Mateo

Scientific Coordinator

Antimicrobial Resistance and Veterinary Products Department, WOAH



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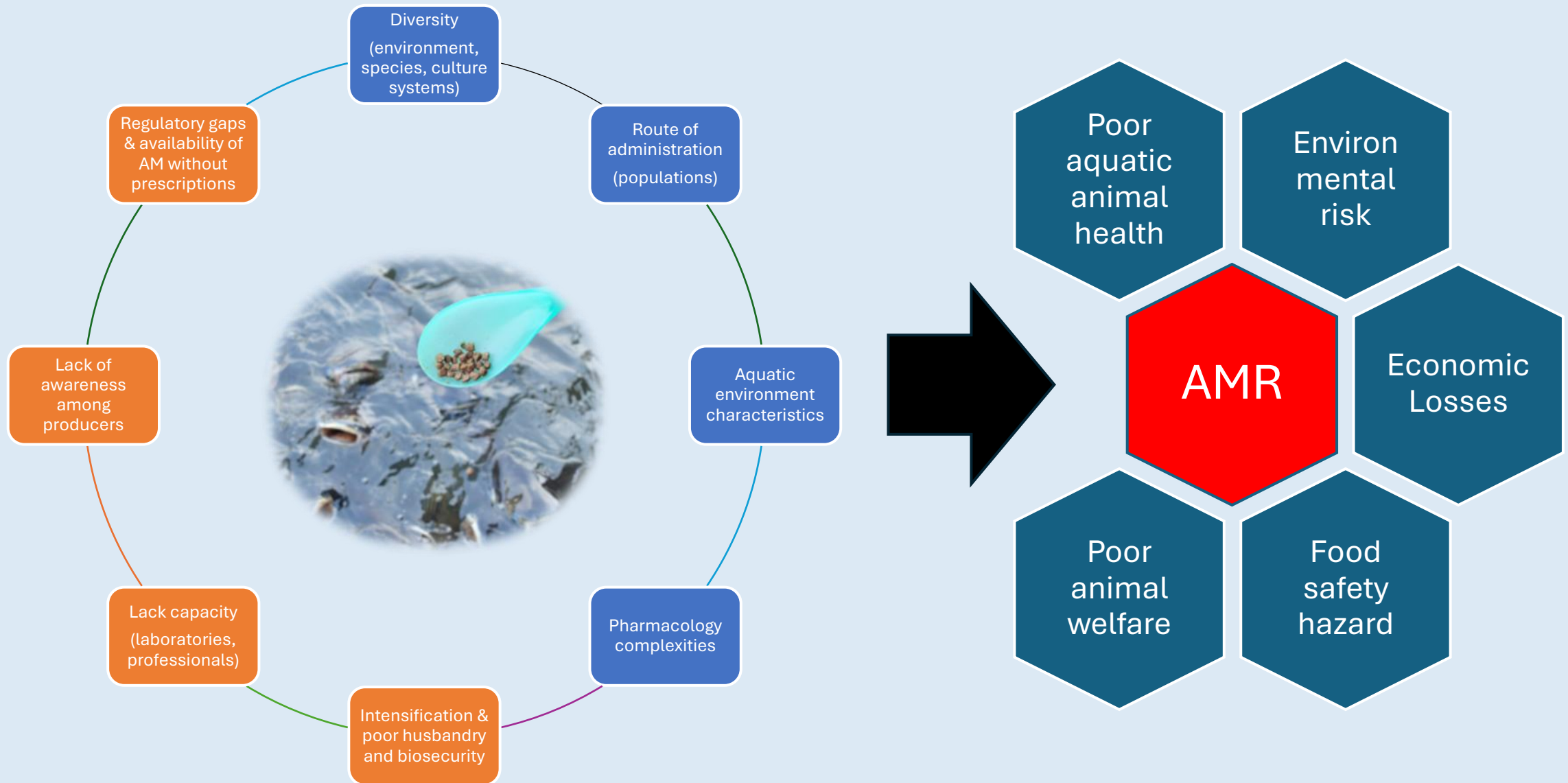


وزارة البيئة والمياه والزراعة
Ministry of Environment Water & Agriculture

Kingdom of Saudi Arabia المملكة العربية السعودية



Factors in aquaculture influencing AMU & AMR





WOAH Standards: Sources of AMU data



Terrestrial Code: Chapter 6.9 *Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals*

Aquatic Code: Chapter 6.3 *Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals*

Articles 6.9.4 (Terrestrial Code) & 6.3.3 (Aquatic Code): ***Development and standardisation of monitoring systems for antimicrobial agents***

Sources of data on antimicrobial agents

- a) *Basic sources:* customs, imports, sales, etc.
- b) *Direct sources:* registration authorities, manufacturers, wholesalers, retailers, feed stores, feed mills
- c) ***End-use sources: Veterinarians, Aquatic Animal Health Professionals, Animal Producers (terrestrial and aquatic)***
Useful for accurate/specific data: captures extra/off label use
- d) *Other sources:* Pharmaceutical industry associations, veterinary and aquatic animal health professionals' associations

Field & farm level data





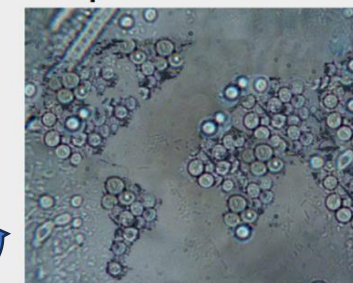
Imports & sales vs Field level AMU data



وزارة الزراعة
والمصايد
والسمك

Annual Report on Antimicrobial Agents Intended for Use in Animals

9th Report



World Organisation
for Animal Health

Imports & sales data

- Obtained mainly from **wholesalers, retailers, feed mills, customs declarations**
- Provides an estimation of AMU at a **country level**
- International reporting: data collected by WOAH through **ANIMUSE** (currently 11th round)

Field level data

- Originates from monitoring antimicrobials **directly administered or prescribed** to animals
- Usually at a very **local level**

Recipient species

- Finfish, crustaceans, mollusks, amphibians

Route of administration

- Oral (medicated feed, water), Injection

Dosage and duration

- Amount of mg per kg fish per number of days

Purpose of treatment

- Treatment (therapeutic), control (metaphylaxis), prevention (prophylaxis)

Type of use

- On/Off label, Authorized/unauthorized

Imports

Sales

Prescriptions

Farm use
records

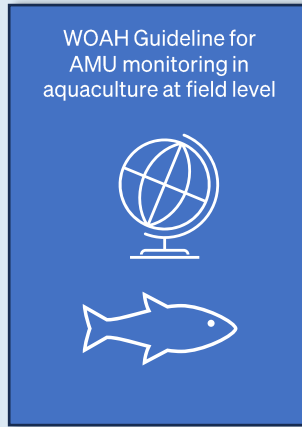




Technical Expert Group – AMU monitoring in aquaculture at field level



Q4 2023



Q4 2025



Name	Professional affiliation
Dr Sameh ABDELAZEEM	Central Laboratory for Aquaculture, Agriculture Research Center, EGYPT
Dr Nelly ISYAGI	Fisheries and Aquaculture Trade and Investment Expert AU-IBAR, KENYA
Dr Indrani KARUNASAGAR	Nitte University, FAO Reference Center AMR, INDIA
Dr Marcela LARA	Centre for Antimicrobial Stewardship on Aquaculture CASA (WOAH CC), CHILE
Dr Dušan PALIĆ	Fish Diseases and Fisheries Biology Ludwig-Maximilians-Universität München, GERMANY
Dr Sophie ST-HILAIRE	Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, CHINA
Dr F. Carl UHLAND	Foodborne Disease & AMR Surveillance Division, Centre for Food-borne, Environ & Zoonotic, Public Health Agency of Canada, CANADA



Objectives of AMU field level monitoring

Characterize AMU patterns

Qualitative

Targeted species, importance to human health, route of administration, purpose

Quantitative

Absolute or relative to animal biomass, feed weight, water volume

Track AMU trends over time

Repetitive surveys

"Snapshot" from different farms each round

Time series analysis

Trend analysis from same farms

Ensure regulatory compliance

Detect off-label applications

Detect unauthorized use

Compare across species, environment, production types and systems

Finfish, shellfish

Freshwater, marine, brackish Cold, temperate, tropical

Monoculture, polyculture, integrated

Ponds, tanks, raceways, netpens, cages

Support AMR risk assessment

Identify selection pressure

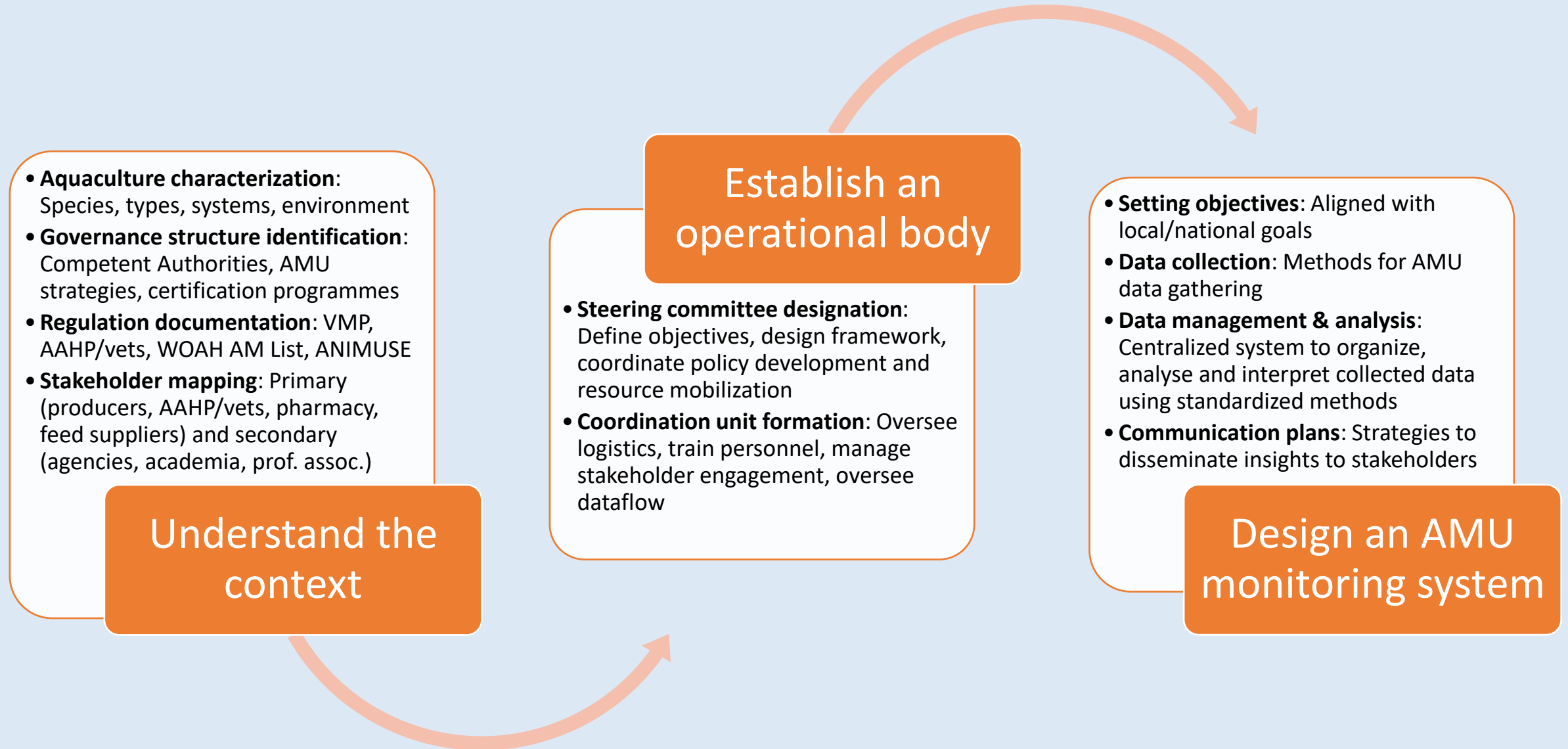
Evaluate intervention impacts

Develop AMU stewardship programmes

Self-assessment (against local, national, regional or global averages)

Incentives Discounts, certifications

Designing a system for AMU field level monitoring



Designing an AMU data collection plan

Goals and timelines

- Define purpose, key milestones and expected outcomes

Roles and responsibilities

- Determine responsibilities for each component of the data collection

Types and sources

- Specify data type (product names, dosages, treatment durations), and identify appropriate sources (farm records, prescriptions, feed mill logs)

Tools and protocols

- Describe instruments and procedures (standardized forms, digital platforms) and data protection measures

Budget and resources

- Include estimates for staffing , training, equipment, and other operational costs

Data flow and governance

- Map transmission of farm data to the covered geographical area

Training and rollout strategy

- Detail training plan for enumerators, system piloting and scaling up implementation

Indicators		Characteristics	Pros	Cons
QUALITATIVE		- Used to gain preliminary insights. - Are focused on appropriateness and effectiveness. Ex. Use of tetracyclines in an aquaculture establishment	Straight forward to collect and interpret	Do not reflect magnitudes
QUANTITATIVE	Count based	- Basic information related to frequency of AMU. - Usually given as proportion. Ex. 100 aquaculture establishments using antimicrobials out 400 surveyed or 25%	Straight forward to collect and interpret	Do not reflect AMU quantities
	Weight based	- Amount of antimicrobial used over a defined period relative to aquatic animal biomass - Reflects intensity of use Ex. 350 mg of antibiotic AI / kg of fish biomass		
	Dose base	- Estimates the number of defined daily doses - Allow comparisons across antibiotics with varying dosage regimen Ex. 1400 doses per MT of harvested fish	Standardized comparison across antimicrobial classes	Limited applicability for off-label use Require detailed data

Count base indicators

$$\text{Proportion of (ex. farms) exposed to AM} = \frac{\text{number of (farms) treated}}{\text{Total number of (farms) monitored}}$$

$$\text{Example: } \frac{(100 \text{ Farms treated})}{400 \text{ Farms monitored}} = 0.25 \text{ or } 25\%$$

Weight base indicators

$$\text{AMU weight based metric} = \frac{\text{amount active ingredient of antibiotic(s) used per year/cycle (mg)}}{\text{total biomass of aquaculture species exposed per year/cycle (kg)}}$$

$$\text{Example: } \frac{74.9 \text{ kg AM or } 74930000 \text{ mg}}{210000 \text{ kg biomass harvested}} = 357 \text{ mg AM per kg of harvested shrimp}$$

Dose base indicators

$$nDDD_{\text{vet drug}} = \text{Number of doses per tonne of aquatic animals} = \frac{nDDD_{\text{vet drug}}}{\text{biomass harvested in tonne}}$$

$$\text{Example: } \frac{7672500 \text{ doses}}{5401 \text{ tonnes biomass harvested}} = 1.42 \text{ doses per kg of harvested fish}$$

Dissemination and communication of AMU data

Define purpose
and objectives

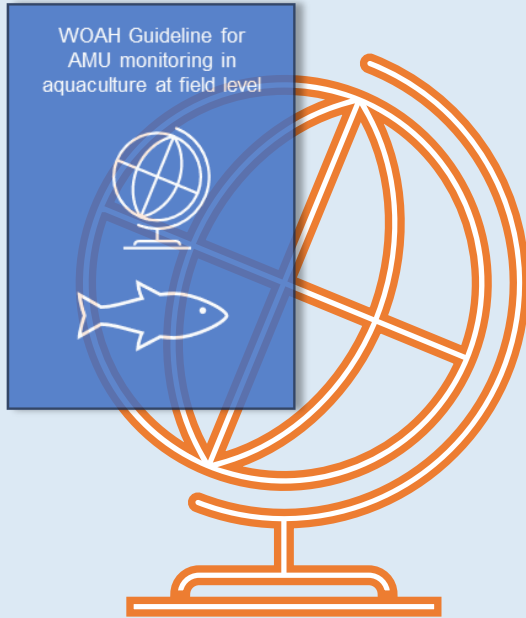
Craft clear
targeted
messages

Identify
recipients and
messengers

Maximize
coverage and
impact

Establish
communication
policies and
guidelines

Monitor and
evaluate
effectiveness



WORKSHOP – Asia and the Pacific region

- 1st week December 2025
- Detailed description of guideline
- For FP-AA of 10 countries in Asia and the Pacific

IMPLEMENTATION – Asia and the Pacific region

- 2nd week December 2025
- Hands on training on AMU data collection in aquaculture establishments
- For Competent Authorities of two selected countries

Identification of selected countries for guideline implementation in other Regions

Middle East: ?

Thank you!

d.mateo@woah.org

12, rue de Prony, 75017 Paris, France

T. +33 (0)1 44 15 19 49

F. +33 (0)1 42 67 09 87

woah@woah.org

www.woah.org

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