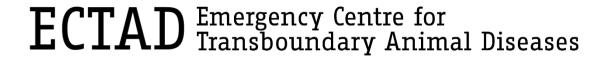


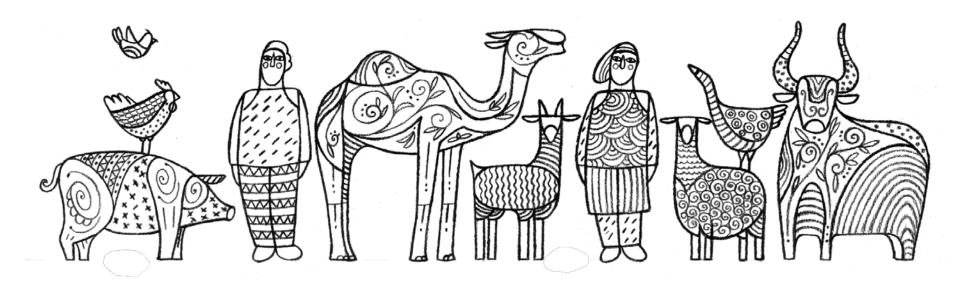


# Protecting people and animals from disease threats





# FAO Activities on AMR Surveillance



Mary Joy Gordoncillo

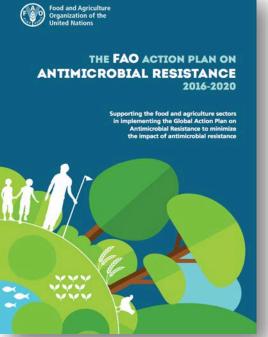
NVAL-OIE Joint Seminar on Antimicrobial Resistance \* Tokyo, Japan

# Cascading the FAO Action Plan on AMR in the Asia-Pacific Region



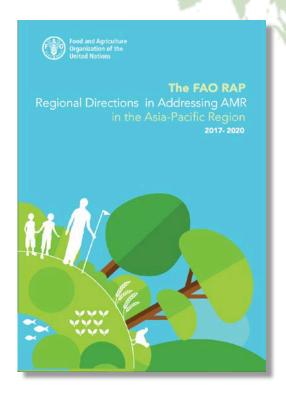




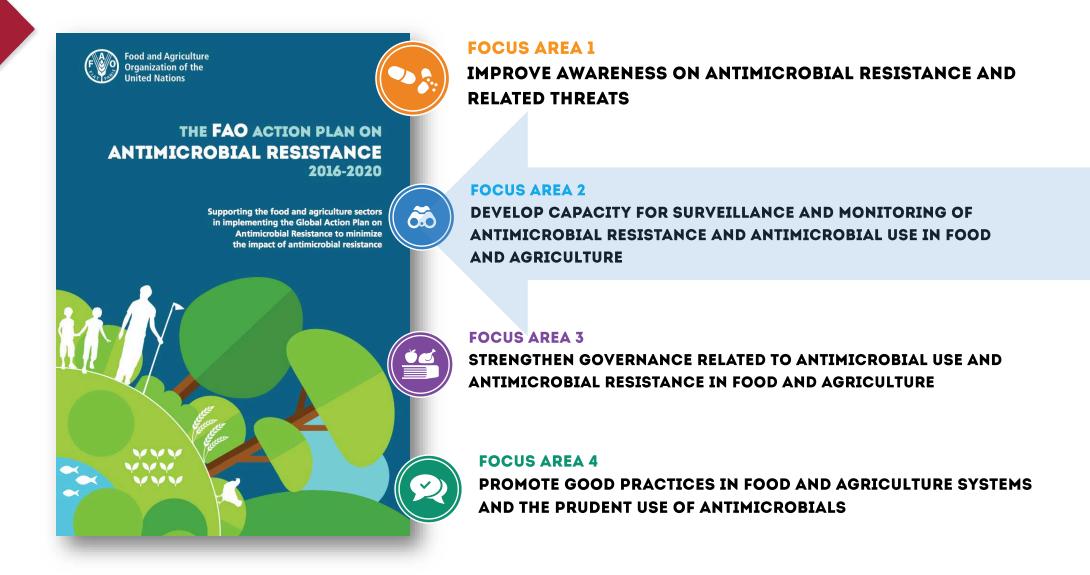


FAO RAP

REGIONAL DIRECTIONS



#### FAO AMR Initiatives in Asia and the focus areas of the FAO Action Plan



#### **FAO AMR Initiatives in Asia**



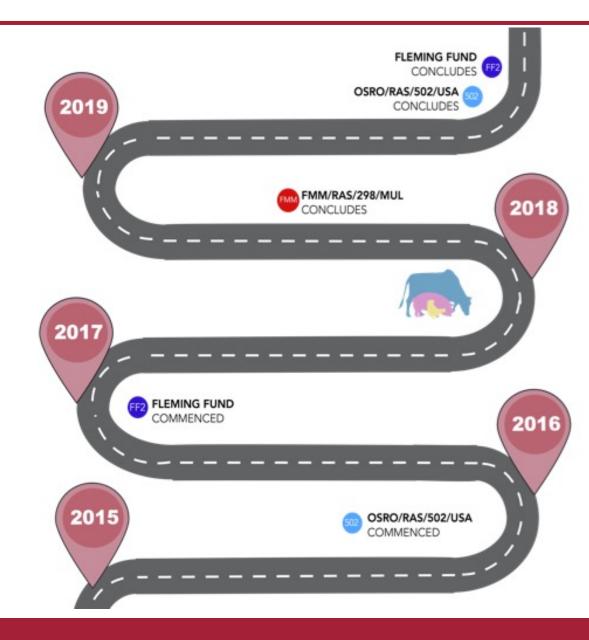
OSRO/RAS/502/USA: Addressing Antimicrobial Usage in Asia's Livestock, Aquaculture and Crop Production Systems



FMM/RAS/298/MUL Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries (aquatic animal health and aquaculture component)



GCP/GLO/710/UK Engaging the food and agriculture sectors in sub-Saharan Africa and South and South-east Asia in the UK Government global efforts to combat antimicrobial resistance using a One Health approach



# OSRO/RAS/502/USA: Addressing Antimicrobial Usage in Asia's Livestock,

Aquaculture and Crop Production Systems



Policy Review Framework
Addresses the challenges mentioned by offering practical guidance to government authorities, policy-makers and other stakeholders to systematically identify, assess and strengthen stakeholders and provides examples from countries review their own national policies, and provides examples from countries that facilitate effective national response to AMR.

FAO-OIE initiatives mapping on AMR in Asia
To bring complementarity and synergy to the individual work plans of FAO and OIE in the agriculture sector, the three regional offices in Asia decided to come together to: (1) provide updates and exchange information on current AMR initiatives in the region; (2) identify gaps, overlaps, and potential points of synergy for each area of work; and

(3) Identify flagship FAO-OIE activities in the region.

OUTPUT 1: IMPROVED UNDERSTANDING AND DOCUMENTATION OF AMU

Liverpool University:

Engage with the public and private sectors and research projects in Thailand and Vietnam (and later Indonesia) to assist in identifying and measuring AMU and the potential impacts of AMR in the intensive livestock and aquaculture sectors

IHPP Thailand

Antibiotic consumption in citrus trees and its potential environmental impacts

**GOVERNANCE** 

**SURVEILLANCE** 

Assessment of AMR laboratories
(ATLASS Missions) conducted
Using the FAO ATLASS tool, the AMR surveillance systems and laboratories of 8 of the 10 ASEAN Member States have been conducted.

Regional ATLASS Assessors Training have also been organized, and the ATLASS assessors community is now established.

AMR surveillance piloted
AMR surveillance in healthy broiler poultry was piloted in Subane, indonesia. A second pilot work on AMR surveillance clinically diseased layer poultry will commence in late 2018.

PRACTICES





# OSRO/RAS/502/USA: Addressing Antimicrobial Usage in Asia's Livestock,



### **OUTPUT 4.1:**Development of Regional AMR/AMU Surveillance Guidelines

# **Development of AMR/AMU surveillance guidelines**

FAO RAP has embarked in facilitating the development of a series of regionally harmonized guidelines relevant to this sector:



Guideline #1: AMR surveillance in food-borne bacteria from healthy animals intended for food consumption



Guideline #2: AMR surveillance in animal pathogens recovered from clinically or subclinically diseased livestock and poultry



**Guideline #3:** AMR surveillance in aquaculture

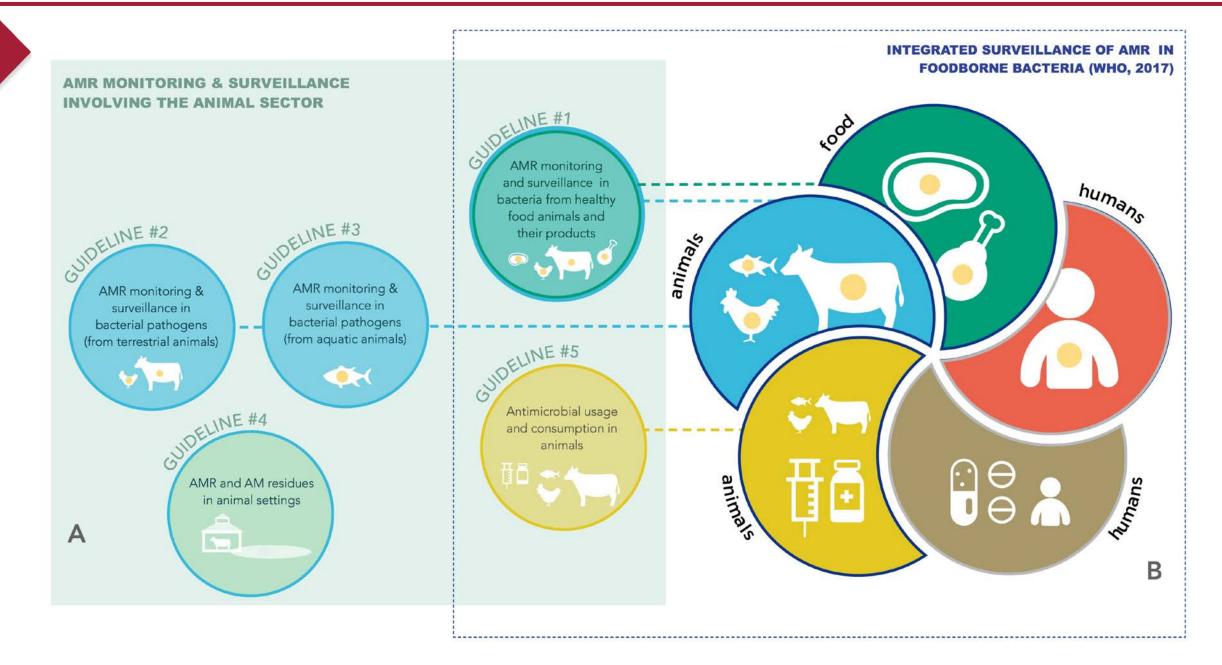


Guideline #4: AMR monitoring in animal settings/environmen t In addition



**Guideline #5:**Guideline on AMU data collection

# **OUTPUT 4.1:** Development of Regional AMR/AMU Surveillance Guidelines



## **OUTPUT 4.1:** Development of Regional AMR/AMU Surveillance Guidelines

These guidelines will ....

- be anchored on international standards
- take into context the **varying levels of advancements** within the region
- take into account the overall context in the region
- help Countries in preparing to carry out their respective initiatives
- help facilitate generating a cohesive body of regional information
- reinforcing One Health approach to AMR Surveillance in the Asia-Pacific
   Region → TRANSFORMING AMR SURV WORK FROM SILOS TO PILLARS

# → Assessment of AMR laboratories (ATLASS Missions) conducted

Using the FAO ATLASS tool, the AMR surveillance systems and laboratories of 8 of the 10 ASEAN Member States have been conducted.

FAO- Assessment Tool for Laboratories and AMR Surveillance Systems

(FAO-ATLASS)

#### BACKGROUND

Antimicrobial resistance (AMR) poses a fundamental threat to human and animal health, development, and security. Common and life-threatening infections are increasingly becoming untreatable because of AMR:

Following the adoption of the FAO Resolution in June 2015, FAO Action plan on AMR was developed to promote and strengthen the development and the implementation of national action plans against AMR through a "One Health" approach. One of the four focus areas of the FAO Action plan is to strengthen the evidence base through a developed capacity for surveillance of AMR in food and agriculture (Focus Area 2)<sup>a</sup>. AMR surveillance is the cornerstone for assessing the level of AMR and for providing information for action in support of local, national and clobal strategies.

As part of the efforts to strengthen the evidence base focus area, FAO has developed the "Assessment Tool for Laboratories and AMR Surveillance Systems" (FAO-ATLASS) to support food and agriculture sectors of countries in assessing their surveillance system related to AMR.

The first step proposed with the use of ATLASS is to map the existing national AMR surveillance system in the food and agriculture sectors, including laboratory analytical capacities and networks, to determine gaps in the system and define targets for capacity building. Recommendations from the assessment will be drawn to the country on: (1) How to strengthen the national AMR surveillance system; (2) How to improve coordination among all actors of the AMR surveillance systems at national level, including better linkages between public health and veterinary public health.

This will also allow better harmonization and improved coordination across AMR surveillance systems to ensure a regional/global surveillance of AMR.

#### **CONTEXT OF ATLASS USE**

ATLASS can be used in the context of projects to generate a baseline, monitor progress and support countries in building their AMR surveillance network, and can also be used by any country on a voluntary basis. ATLASS helps countries to prioritize actions in building reliable national AMR surveillance system

ATLASS can be applied as a standardized support for an external assessment of the AMR surveillance system or as a self-assessment tool when it is applied by national experts trained in the use of the tool.

Global Action Plan on Antimicrobial resistance http://www.who.int/antimicrobial-resistance/global-action-pla
 FAO Action Plan on AMR 2016-2020 <a href="http://www.fao.org/3/a-15996e.pdf">http://www.fao.org/3/a-15996e.pdf</a>

#### **GENERAL SCOPE**

Map national AMR surveillance system in the food and agriculture sectors, including laboratory networks and analytical capacities.

Provide evidence base for action and advocacy to strengthen AMR surveillance systems, including coordination between actors and capacity building efforts for the laboratory network.

Monitor AMR surveillance capacities under the food and agriculture sectors at national/regional and global levels.

Describe the linkage with AMR surveillance in public health and the environment

#### **SPECIFIC OBJECTIVES**

Assess the five major pillars in the AMR surveillance: (1) laboratories, (2) epidemiological unit, (3) governance, (4) communication, and (5) sustainability.

Assess the AMR surveillance institutional framework in the Veterinary Public Health domain and linkages with Public Health surveillance.

Measure the level of activities of AMR surveillance, laboratory testing, networking, data collection and collation, analysis and information dissemination; Assess AMR testing and epidemiological capacities.

Measure the progress via ATLASS Progressive Improvement Pathway (PIP) indicators relative to each pillar of the national AMR surveillance system, to be linked with the National/FAO global AMR Action Plan and other initiatives.





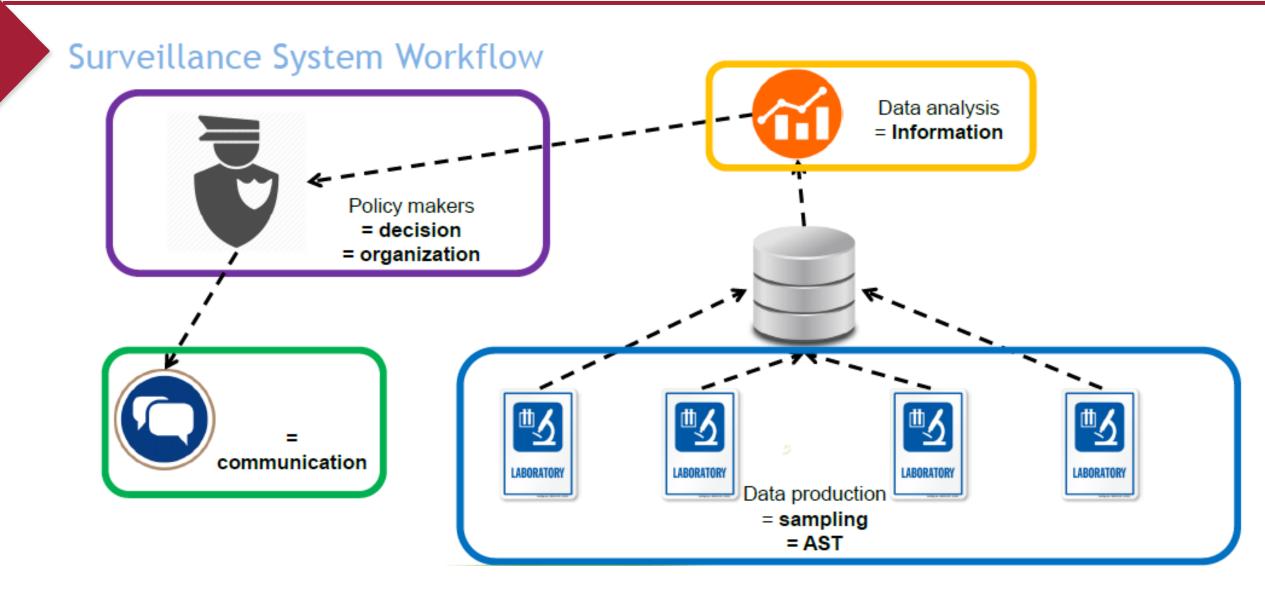






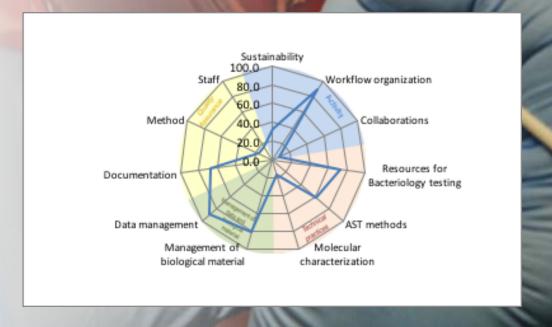






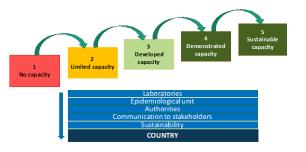
Current Assessment*				
Category	dd/mm/yyyy - LMT-AMR Results for Lab X			
Sustainability	33.3	0 100		
Workflow organization	88.9	0 100		
Collaborations	8.3	0 100		
Resources for Bacteriology testing	73.3	O 71		
AST methods	61.1	O 75		
Molecular characterization	16.7	0 100		
Management of biological material	80.0	0 100		
Data management	88.9	0 100		
Documentation	66.7	0 100		
Method	16.7	0 100		
Staff	16.7	0 100		
Grand Total assessment C	55.6	90		
Activity	40.7	0 100		
Technical practices	59.0	O 76		
Management of data and biological material	83.3	0 100		
AQ	33.3	0 100		

Current Assessment*			
Area dd/mm/yyyy - LMT-AMR Results for Lab X		Confidence*	
Activity	40.7	0 100	
Technical practices	59.0	O 76	
Management of data and biological material	83.3	0 100	
AQ	33.3	0 100	



Area	Category	Sub category	Current lab LMT score	Improveme nts for next level	Next level
Sustainability		Financial autonomy (allocation of funds)- L1	2		≥1
	Sustainability	Management- L2	2		≥1
	Workflow organization	Time for samples submission - L3	4		≥3
Activity		Training about antimicrobial resistance- L6	1		≥1
	Collaborations	Scientific publications- L7	1		≥1
	Collaborations	Collaboration with other labs- L8	2		≥1
		Collaboration with international reference labs- L9	1		≥1
		Biosafe Bacteriology lab- L10	3		≥2
		Equipment for bacteriology and AST - L11	3	l 1	≥3
		Media and consumable- animal disease- L12	3	l 1	≥3
	Resources for Bacteriology testing	Media and consumable- food safety- L13	4		≥3
	testing	Media and consumable- environment - L14	4		≥3
		Reagents- L15	3		≥3
		Bacterial identification- L16	4		≥2
Technical		Standard for AST- L17	4	_	≥2
		Bacterial inoculum calibration- L18	4		≥3
practices		Panels definition- L19	2		≥4
	Antimicrobial	Revision of panels of antibiotics- L20	2		≥3
	susceptibility testing (AST) methods	Interpretation of AST results- L21	2		≥2
	methous	Interpretation of MIC results -L22	N/A		≥2
		Standard for AST interpretation- L23	3		≥3
		Standard for MIC interpretation- L24	N/A		≥3
	**	Molecular characterization - L25	1		≥1
	Molecular characterization	Sequencing of resistant strains- L26	2		≥1
		Sample identification and follow-up- L27	3		≥2
	Management of biological material	Isolates library- L28	2		≥1
Management of		SOPs for bacterial preservation- L29	4		≥1
data and		Inventory of stored isolates- L30	4		≥1
biological		Duration for bacterial isolates storage- L31	4		≥1
material		Individual reports on AMR data- L32	3		≥3
	Data management	Data archiving- L33	4		≥2
		AMR data transmission and analysis- L34	4	l 1	≥1
		SOPs implemented- L35	3		≥2
Quality Assurance	Documentation	SOPs updating- L36	3		≥2
	Method	Reference strains- L37	2		≥2
		Proficiency testing- L38	1		≥2
	Staff	Training in AMR testing- L39	1		≥1
		Staff validation and proficiency continuity- L40	2		≥1
		Lab X PIP Stage	2		> 3

	Scoring system:					
LMT #				Demonstra	Sustainable capacity	
	No capacities	Limited capacity	Developed capacity	ted capacity	For routine lab	For Ref lab
L1	≥1	≥1	≥1	≥2	≥3	≥4
L2	≥1	≥1	≥1	≥2	≥3	≥3
L3	≥1	≥2	≥3	≥3	≥3	≥3
L6	≥1	≥1	≥1	≥1	≥1	≥3
L7	≥1	≥1	≥1	≥1	≥1	≥3
L8	≥1	≥1	≥1	≥1	≥2	≥3
L9	≥1	≥1	≥1	≥1	≥2	≥3
L10	≥1	≥2	≥2	≥3	≥3	≥3
L11	≥1	≥2	≥3	≥3	≥3	≥3
L12	≥1	≥2	≥3	≥3	≥3	≥3
L13	≥1	≥2	≥3	≥3	≥3	≥3
L14	≥1	≥2	≥3	≥3	≥3	≥3
L15	≥1	≥2	≥3	≥3	≥3	≥3
L16	≥1	≥1	≥2	≥2	≥2	≥4
L17	≥1	≥1	≥2	≥3	≥4	≥4
L18	≥1	≥1	≥3	≥3	≥3	≥3
L19	≥1	≥2	≥4	≥4	≥4	≥4
L20	≥1	≥2	≥3	≥4	≥4	≥4
L21	≥1	≥1	≥2	≥2	≥2	≥2
L22	≥1	≥1	≥2	≥2	≥2	≥2
L23	≥1	≥2	≥3	≥4	≥4	≥4
L24	≥1	≥2	≥3	≥4	≥4	≥4
L25	≥1	≥1	≥1	≥1	≥1	≥2
L26	≥1	≥1	≥1	≥1	≥1	≥3
L27	≥1	≥2	≥2	≥3	≥3	≥3
L28	≥1	≥1	≥1	≥2	≥2	≥2
L29	≥1	≥1	≥1	≥3	≥3	≥3
L30	≥1	≥1	≥1	≥3	≥3	≥3
L31	≥1	≥1	≥1	≥2	≥3	≥4
L32	≥1	≥2	≥3	≥4	≥4	≥4
L33	≥1	≥2	≥2	≥3	≥3	≥3
L34	≥1	≥1	≥1	≥2	≥3	≥3
L35	≥1	≥1	≥2	≥3	≥3	≥3
L36	≥1	≥1	≥2	≥3	≥3	≥3
L37	≥1	≥1	≥2	≥3	≥3	≥3
L38	≥1	≥1	≥2	≥3	≥3	≥3
L39	≥1	≥1	≥1	≥2	≥3	≥3
L40	≥1	≥1	≥1	≥2	≥3	≥3
PIP Stage scoring:	1	2	3	4	5	5



Country PIP: 1	Scores	Improvements for next level	Next country score 2
Laboratories	1		≥2
Epi	1		≥2
Authorities	1		≥1
Communication	2		≥1
Sustainability	2		≥1
Country stage (2017)	1		2

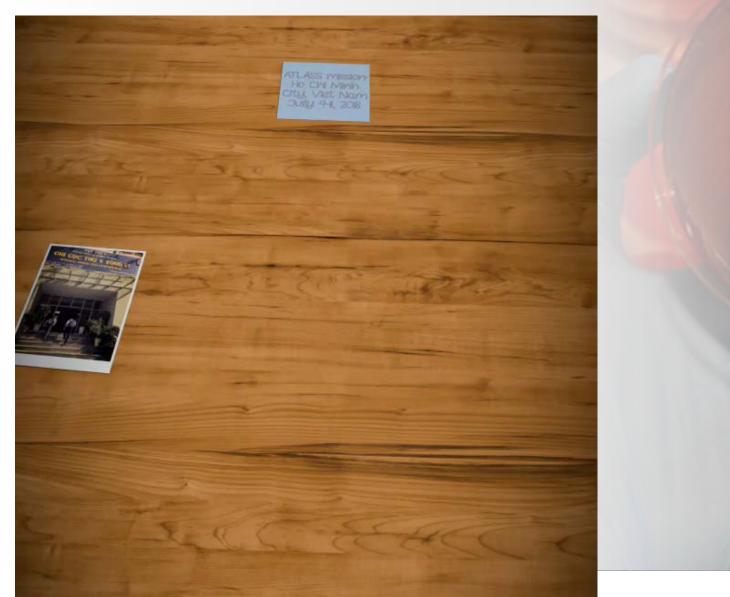
No capacities	Limited capacity	Developed capacity	Demonstrat ed capacity	
≥1	≥2	≥3	≥4	5
≥1	≥2	≥3	≥4	5
≥1	≥1	≥2	≥3	≥4
≥1	≥1	≥1	≥3	≥4
≥1	≥1	≥1	≥4	5
1	2	3	4	5

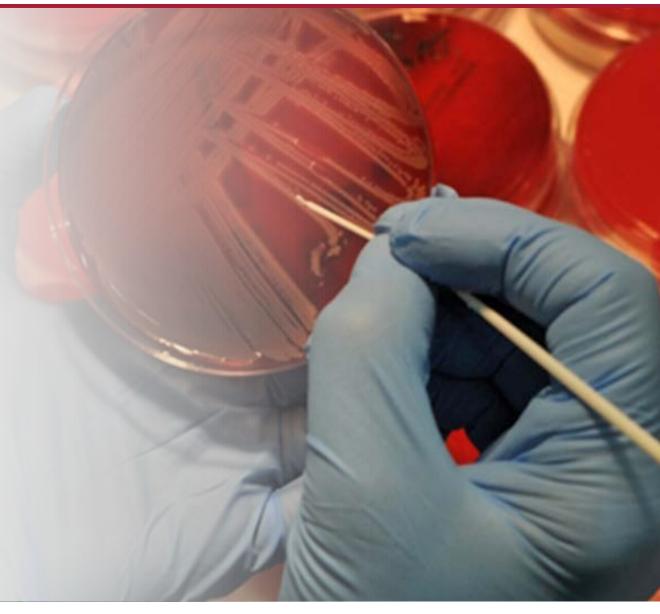
# → ATLASS assessors community is currently being established

- ATLASS assessors training (May 2018)
- Mentoring missions
- Certified ATLASS assessors









#### **OUTPUT 4.3:** National AMR Laboratories are progressively strengthened

# → Post-ATLASS Workshop

Using the findings from the FAO ATLASS mission, strategies to move up to the current stage (at least PIP stage 3) are planned and mapped out.



Following the ATLASS mission, the mission team prepares a comprehensive report of the assessment which includes a set of recommendations on the current state of the country's AMR surveillance systems and laboratory capacity in carrying out AST.



Relevant personnel involved in AMR surveillance (technical and governance) will identify **STRATEGIC ACTIONS** to address the recommendations to strengthen country capacities in sustainably carrying out AMR surveillance in the animal sector.

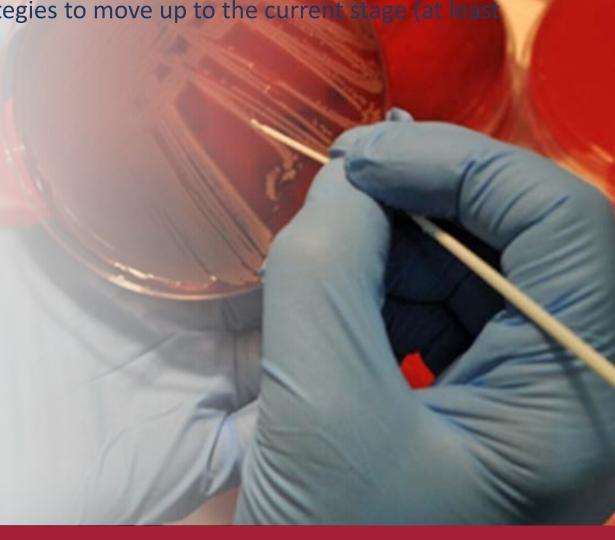
Prioritization, timelines, budgets (if feasible) of the listed actions will also be done.



Resources for each listed activty will be identified. This will include internal and external resources which may acknowledge activities as complementary and/or of relevance to the nature of the support being provided.



A package of suitable advocacy materials (powerpoint, print, etc.) will be prepared. These materials will comprehensively outline the details of the actions planned to strategically improve AMR surveillance in the animal sector. These materials will be developed for the purpose of conveying the current plans to address gaps in AMR surveillance, and of advocating further investments towards sustainable, routine AMR surveillance in the country.



### **OUTPUT 4.3:** National AMR Laboratories are progressively strengthened

→ Establishment of FAO Regional Reference Center for AMR in livestock (Chulalongkorn University)

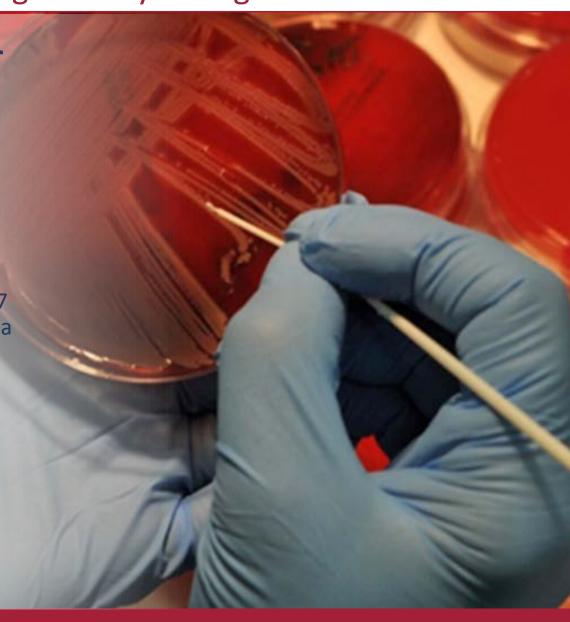
CU is now in the final stages of becoming the FAO Regional Reference Center.

Regional Training on Harmonized and Standardized AST

In collaboration with CU, this training was conducted in June 2017 for South-East Asia, and the same will be conducted for South Asia in May 2019.

Conduct of proficiency testing on AST

To be done in collaboration with CU VET AMR (2018-2019)



# **OUTPUT 4.4:** In-country pilot projects

# → AMR surveillance piloted

AMR surveillance in healthy broiler poultry was piloted in Subang, Indonesia. A second pilot work on AMR surveillance clinically diseased layer poultry will commence in late 2018.

#### **OUTPUT 4.4:** In-country pilot projects







#### 1. WHAT WILL BE COLLECTED?



It is preseumed that approximately 89% of animicrobial usage in indonesia usitized by the poultry sector. For 2017 II was decided that AMR surveitance will thus initially start with broilers and expand from there.



recommendations and harmonize with the region, indocesia decided to first start with the two more common bacterial food-borne zoonoses (Sakmonella spp) and commensal becteria (E. coli)

I As part of the passive aurvollance, clinical pathogens (eg., Posteurella



To follow international recommendations and harmonize with the region, and considering the local setting in the country, it was decided that occal samptes from slaughterhouses and slaughterpoints will be collected.

Some DICs have existing programs for sampling from farms for months programs. If is planned that samples from bood easitie from farms will be of

#### 2. HOW MANY SAMPLES WILL BE COLLECTED?

A consultation with national experts was organized to determine the sampling approach. The group agreed to set the following conditions:

90% LEVEL
Degree of PRECISION 5%

prevalence of AMR

needed to estimate the

SINCE: it is estimated that Recovery Rate of Salmonella spp from broilers is at

2.700

No. of broilers to sample to obtain 270 isolates

While this was the agreed direction to be taken for the next years, the implementation for 2017 was limited with the standing national arrangements which has started in oral cut sealine in the year. Nevertheless, to determine the feasibility in projected implementation, it was agreed that at least one DIC Subanglivel the plotted for 2017 following this overarching design.

#### 3. WHERE WILL THE SAMPLES COME FROM?

Since it was agreed at the national level that all the DICs will be involved in the National AMR Syrveillance, THE TECHNICAL WORKING GROUP OPTED FOR PROPORTIONATE STRATIFIED SAMPLING INCLUDING ALL THE 8 REGIONAL LABORATORIES (DICs) IN INDONESIA. The "share" of samples from each DIC will be proportionate to the broiler poultry population in their respective DICs.

BYT MELON

SA THE PLANT PRODUCT STATE

AND THE PLANT PRODUCT STATE

FOR THE MATERIAL PRODUCT S

#### 4. WHAT WILL BE THE ROLE OF THE LABS?

SPECIMEN COLLECTION, BACTERIAL ISOLATION and IDENTIFICATION will be done at the DICs, All isolates will then be sent to the national laboratories; SPMSSH (for food animal products) and BPMSOH (for specimens, obtained from farms) for a harmonized approach to ANTBIOTIC SUSCEPTIBILITY TESTING

#### 5. HOW WILL THE SAMPLES FROM THE ABATTOIRS BE SELECTED?





# **OUTPUT 4.4:** In-country pilot projects

**EXISTING AND** ACCESSIBLE SUPPORTING RESOURCES





**PVUK/Vet Service Officers** 



Ongoing FAO projects (e.g., Healthy Poultry, Healthy People)



Outcomes from previous projects (e.g. Course materials)

Veterinary Schools

COMPO Detection, isolation, identification and AST of \*PRIORITY **BACTERIAL DISEASE** 

in layer poultry farms

Identify priority bacterial disease burden in layer poultry farms through consultation and data review

- Improve capacity of DICs to detect, isolate, identify, and perform AST of this priority
- Improve capacity of DVPH for data collation, interpretation, analysis, synthesis, and sharing with stakeholders



COMPONENT 2

LAYER POULTRY **FARMERS** 

to routinely perform and promote good practices

Layer poultry health distnace learning course

- Enhancing engagement with PVUKs
- Facilitating access to previous project outomes (e.g., biosecurity concept)

OMPONENT 3

Adding value to existing

**AMU PROJECT** 

which will determine AM

usage in sentinel farms

AMU data (existing project) AMR data in commesals

- Knowledge, attitude, practices
- -Status of biosecurity
- Production data
- Flock health data

OMPONENT 4 Advance training/mentoring/distance learning of PVUKs on \*priority syndrome of poultry

- Development of mechanisms for service access
- Improving capacity of pilot DIC to address \*prioritiy syndrome of poultry
- Improving feedback mechanisms to end-users of results and findings



**a** 

Cost-benefit analysis



Protocols and mechanisms for operational, routine monitoring & surveillance

SENTINEL FARMS

THITTIES OF THE TOTAL

SEPTEMBER to DECEMBER 2018

PHASE 2.1 - INITIAL IMPLEMENTATION

JULY to SEPTEMBER 2018 PHASE 2.0 - PRE-INITIATION

#### CONTEXT DEVELOPMENT

- Stakeholder consultation and on \*priority poultry bacterial diseases, project design and sentinel enrolment
- Lit review on poult\*priority poultry bacterial diseases in Indonesia
- Lit review on new technologies and rapid diagnosis for \*priority poultry bacterial diseases
- Development of inclusion criteria for paticiption as sentinel farm
- Refinement and finalization of project design

#### MATERIALS DEVELOPMENT

- Development of survey forms
- Setting up of modules/scripts for the layer poultry health course for
- Setting up of modules/scripts for the layer poultry health course for farmers
- Development of protocols for operationalization
- TORs of partners and players
- Procurement

#### **IMPLEMENTATION 1: WATES**

- Identification of sentinel farms
- Data collection from sentinel farms (in collaboration with existing project)
- Capacity building activities for PVUKs and farmers
- Protocols/Guideline development for operationalization

identified priority bacterial disease

in poultry in Indonesia.

#### **IMPLEMENTATION 1: DICs**

- Capacity building of DICs on identified priority bacterial disease in layers
- Initial data collection from DICs
- Protocols/Guideline development for operationalization

JANUARY to SEPTEMBER 2019:

#### PHASE 2.2 - DATA GENERATION, ANALYSIS, REPORTING

#### **IMPLEMENTATION 2: WATES**

- Continued capacity building of PVUKs and farmers
- Post-implementation data collection
- Refinement of mechanisms for bridging farms to DICs
- Cost-benefit analysis

#### **IMPLEMENTATION 2: DICs**

- Continued data collection from DICs
- Refinement of mechanisms for clinical disease and AMR surveillance in layers
- Development of treatment guideline

#### BRIEF DESCRIPTION OF EACH COMPONENT

DICs will be sensitized and enabled to detect (through ISIKHNAS or other means), isolate, identify, and obtain AST profile of

To further reinforce health practices, farmers and workers in the sentinel farms will be offered to access a learning platform for layer poultry health management and engage better with PVUKs.



Bridging access to

**POULTRY HEALTH** 

SERVICES

Combined with the planned AMU data collection, a more robust data gathering from enrolled sentinel farms will be done, including AMR profile of commensals.



To reinforce the program, advanced trainings for PVUKs on \*respiratory diseases of poultry will be periodically conducted by poultry health experts.

### **OUTPUT 4.5:** Mechanisms for broader regional coordination

→ FAO-OIE initiatives mapping and coordination: Identified flagship FAO-OIE activities on AMR in Asia:

- 1. Awareness AAW Celebrations
- 2. Surveillance Network of Regional Collaborating and Reference Centers on AMR
- 3. Good practices AMU data collection: National/Global database (OIE) and field data collection (FAO)
- 4. Governance Joint FAO-OIE Regional AMR Mitigation Strategy

#### **OUTPUT 4.6:** Networks of scientific expertise on AMR surveillance in the animal sector

→ Established and convened the AMU/AMR Technical Advisory Group for South-East Asia



→ Future plan: Network of laboratories for AMR surveillance of animal bacterial pathogens from clinical cases

South and South-East Asia in the global efforts to combat AMR using a One Health approach



**Output 1:** Multi-sectoral National Action Plans (NAPs) aligned with global recommendations and standards in place in targeted countries

Output 2: Regulatory frameworks assessed and strengthened

Output 3. Laboratory capacities and related infrastructures of the food and agriculture sector are strengthened to collect and share data on AMR and antimicrobial residues and actively contribute to integrated surveillance on AMR.

**Output 4:** Good practices in the food and agriculture sector, based on internationally instruments, are available to and implemented in target countries

BANGLADESH CAMBODIA LAO PDR PHILIPPINES VIET NAM

# Some key dates in the region

- November 8-9, 2018, Bangkok, TH. "FAO-OIE Consultation Meeting for the Development of Guidelines on Antimicrobial Usage Surveillance"
- November 19-20, 2018, Bangkok, TH. "Regional Post-ATLASS Workshop and AMR Surveillance Planning"
- November 21-22, 2018, Bangkok, TH. "Second Meeting of the AMU/AMR Technical Advisory Group (TAG) for Southeast Asia"
- November 23, 2018, Bangkok, TH. "1st FAO-OIE Joint Meeting of Regional Reference and Collaborating Centers on AMR in Asia"
- January to May 2019. ATLASS Missions in South Asia
- January 2019. ATLASS Assessors Training: India
- May 2019, Bangkok, TH. Training on Harmonization and Stanadardization of Laboratory Methods for Antimicrobial Susceptibility testing (South Asia)



Global health is a shared responsibility





# Protecting people and animals from disease threats

