



Food and Agriculture
Organization of the
United Nations

FMM/RAS/298: Strengthening capacities, policies and national action plans on
prudent and responsible use of antimicrobials in fisheries Final Workshop
in cooperation with AVA Singapore and INFOFISH

12-14 December, Concorde Hotel, Singapore



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FROM THE AMERICAN PEOPLE



Documentation and Characterization of Antimicrobial Use in the Aquaculture Sector

(FAO-NACA project: Thailand, Vietnam, Myanmar and Indonesia)

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FAO Project:

Addressing Antimicrobial Usage in Asia's Livestock, Aquaculture and Crop Production Systems



Project Activities:

- Conduct a review of current aquaculture practices for major aquaculture species in selected countries in Asia;
- Conduct a comprehensive review of diseases affecting the identified major aquaculture species in selected countries in Asia;
- Develop a framework and methodology document on antimicrobial use in the aquaculture industry in Asia to include the value chain, datasets to obtain, specific industry profiles to describe and what assessments will result (e.g. farm level, sector and national level assessments)



Project Activities:

- Pilot the methodology for AMU documentation on selected farms in Indonesia, Myanmar, Thailand and Viet Nam to include analysis of the results of the pilot study;
- Provide recommendations on prudent and responsible use of antimicrobials that will contribute to existing good aquaculture practices (GAP) and good biosecurity practices;



Project Activities:

- Conduct and document aquaculture stakeholder consultations (government, industry and academe) to raise awareness on the purpose and objectives of antimicrobial usage (AMU) and antimicrobial resistance (AMR) surveillance in aquaculture in selected developing countries;
- Using the results of the above activities, identify specific capacity requirements to implement effective AMU and AMR surveillance/diagnosis in the aquaculture sector.



Thailand

Shrimp aquaculture



Collaborator: Department of Fisheries

Dr. Thitiporn Laoprasert

Dr. Juliwan Roongkamnertwongsa

Ms. Jutamass Auewongaree



Viet Nam

Pangas catfish aquaculture



Collaborator: Department of Animal Health

Dr. Nguyen Van Long

Dr. Vo Dinh Chuong

Ms. Bui Thi Viet Hang



Myanmar

Freshwater finfish aquaculture



Collaborator: University of Yangon

Dr. Kay Lwin Tun

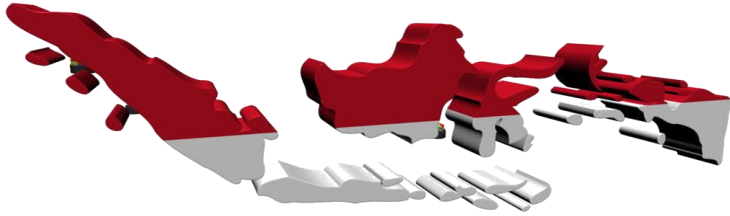
Dr. Hlaing Hlaing Thin Kyi

Dr. Moe Moe (Mandalay University)



Indonesia

Grouper aquaculture



Collaborator: Batam Marine Aquaculture Center

Mr. Toha Tusiadi

Mrs. Sri Agustatik

Ms. Tanjung Dwi Okta Nungraheni



This presentation:

- Survey of AMU in Thailand, Viet Nam, Myanmar and Indonesia
- Results and findings
 - AMU
 - Other chemicals



To undertake the survey

Questionnaire for AMU Survey

A simple questionnaire was developed to collect primary information on AMU in selected species for each country. This questionnaire was translated to local languages (Burmese, Thai, Vietnamese and Bahasa Indonesia).



Questionnaire on Antimicrobial Use in Aquaculture

Farm Information:

+			
Name of Farm:			
Address:			
Owner:			
Species:		Farm Area:	
Type of Operation:	<input type="radio"/> Hatchery	<input type="radio"/> Nursery	<input type="radio"/> Grow Out
	<input type="radio"/> Post Harvest	<input type="radio"/> Processing	<input type="radio"/> Others
System:	<input type="radio"/> Extensive	<input type="radio"/> Semi-intensive	<input type="radio"/> Intensive
	<input type="radio"/> Hyper-intensive	<input type="radio"/> Others	Stocking Density:
Length of Production		Number of Production	



ပုဂ္ဂိုလ်ရေးအဖွဲ့ဝင်များ၏စာမေး

Burmese



ငါးကုန်အိမ်ကုအ

Questionnaire

Thai

Vietnamese

Phiếu khảo sát sử dụng kháng sinh

Bahasa Indonesia

DAFTAR PERTANYAAN PENGGUNAAN ANTIMIKROBIAL
PADA BUDIDAYA LAUT (KERAPU)



ကုန်

(Farm Information)

Name of Farm:

ชื่อฟาร์ม :

Address:

ที่อยู่ :

Owner:

เจ้าของกิจการ :

Species:

ชนิดสัตว์น้ำ :

ကုန်အမည်

လိပ်စာ

ကုန်ပိုင်ရှင်အမည်

မေးမြန်းထားသော ငါး

မေးမြန်းသောပုံစံ

I. Thông tin về cơ sở

1. Tên cơ sở:

2. Địa chỉ:

3. Toa đồ:

4. Tên chủ cơ sở:

5. Loại thủy sản:

7. Loại hình sản xuất:

8. Thời gian cho một vụ

nuôi:

Informasi Pembudidaya

Nama / Pokdakan

Alamat

Pemilik / Ketua

Jenis Ikan

Luas lahan

Jenis usaha

Hatchery

Pendederan

Pembesaran

Pasca panen

Pemrosesan

Lainnya

Sistim usaha

Tradisional

Semi intensif

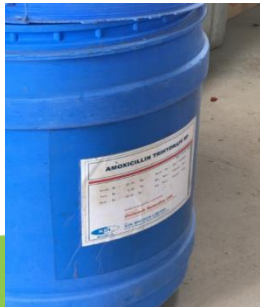
intensif

Super intensif

lainnya



Use of Antimicrobials and Other Chemicals



Thailand



Survey of AMU in shrimp aquaculture in Thailand

Province	Hatchery	Grow-out
Songkhla	3	4
Trang	1	9
Krabi		9
Chantaburi		12
TOTAL	4	34



Thailand



Thailand



Most farmers were very cooperative and willing to provide all the information that were asked. They even showed samples of the products that they are using without any hesitation from them.



Thailand



Antimicrobial used	No. of farms		
	Using antimicrobials	Do not use antimicrobials	Stopped using antimicrobials (past 1-10 years)
Hatchery		0	0
Oxytetracycline	4		
Total (%)	4 (100.0)	0	0

- Antimicrobials (mainly Oxytetracycline) are commonly used in the hatchery operation of shrimps;
- Oxytetracycline is approved by the FDA for use in any aquaculture operations.



Thailand



- Antimicrobials are directly applied in culture water either for prophylaxis (for prevention of disease at zoea stage) or treatment;
- Dosages used ranged from 1,000 to 1,500 mg/Ton;
- Antimicrobials are sourced directly from sales representatives of different drug companies in Thailand



Thailand



Antimicrobial used	No. of farms		
	Using antimicrobials	Do not use antimicrobials	Stopped using antimicrobials (past 1-10 years)
Grow out	7*	9	8
Oxytetracycline	4		
Enrofloxacin	1**		
Total	7 (29.2)	9 (37.5)	8 (33.3)

*3 farms used non-labeled antimicrobials

**used together with other antimicrobials by one farmer

- Most of the farmers has stopped (in the past 1-10 years) using (37.5%) or not using (33.3%) antimicrobials in their culture operations (total percentage=70.8%);
- Few farmers (29.2 %) use antimicrobials for prophylaxis and/or treatment of diseases, especially when threats of AHPND (EMS) and other diseases are imminent;



Thailand



- Commonly used antimicrobials was Oxytetracycline (FDA approved);
- Enrofloxacin was also used by one farmer (this antimicrobial is approved by FDA but is strictly regulated (only with prescription) and for use in fish culture only and not in shrimps);
- Antimicrobials are applied through feed incorporation within the first month of culture. Dosages used were 3,000-5,000 mg/kg feeds for Oxytetracycline, 5 ml/kg feeds for Enrofloxacin;



Thailand



- Antimicrobials are sourced directly from sales representatives of different drug companies in Thailand;
- Withdrawal period: with the practice of most shrimp farmers in using antimicrobials within the first month of grow-out culture only, there is sufficient withdrawal period (around two months) before the shrimps are harvested;



Thailand (Other Chemicals)



- Since most shrimp farmers have stopped using antimicrobials especially for grow-out operations, the following alternative chemicals and compounds are being used for water treatment/disinfection, feed supplementation and for prevention of disease outbreaks:
 - Probiotics (e.g. BioTonic; Plus-10) including Effective microorganisms (EM) locally produced by the DOF and distributed for free to shrimp farmers;
 - Potassium peroxymonosulfide;
 - Water coloring agent (composition not known; used to make the pond water green);
 - Povidone iodine;
 - Chlorine



Thailand (Other Chemicals)

- Vitamin C and Vitamin mix;
- Protein supplement (Beta-Sim-5);
- Pond Plus (Novozymes);
- Astaxanthin;
- Decosohexaenoic acid (DHA; Bi-omega);
- Fermented coconut oil;
- Herbal extracts.

All of the above products are properly registered with the Food and Drug Administration under the Ministry of Public Health for distribution and use in shrimp and fish farms



Viet Nam



Pangas catfish farms surveyed in An Giang, Dong Thap and Can Tho provinces (n=76 farms)

	Hatchery (24 h)	Nursery (68 days)	Grow-out (246 days)
Total no. of farms	2	13	61
Farms with VietGap certificate			26
Farms with ASC certificate			1
Farms with ASC + BAP certificate			2
Farms with ASC+BAP+GlobalGAP certificate			1
Farms with QUACERT certificate	1		
Farms producing for export			51
Farms producing for domestic market			10
Farms producing for both markets			5

Most of farms with international certifications (ASC, BAP, GlobalGAP) are production areas of export companies such as Vinh Hoan, Agifish and Hiep Thanh

Viet Nam

AMU Survey on Pangas Catfish in Viet Nam



Viet Nam

Hatchery

Hatcheries do not use any antimicrobials:

- broodstock are highly resistant to diseases;
- fish larvae are maintained at the hatcheries at a very short period (less than 24 hours post hatching) prior to selling to nursery farms



Viet Nam

Nursery and Grow-out



- Antimicrobials are used widely at the surveyed farms (66/76 farms; 86.84%) under different commercial names (brand names) and active ingredients;
- As the nursery is a very sensitive stage in terms of susceptibility to many diseases, and often suffers huge losses, farmers have to use various kinds of antimicrobials to deal with disease problems.



Viet Nam



Antimicrobials (n=14)	No. of farms	Percentage (%)
Amoxicillin	37	56.06
Doxycycline	31	46.97
Florfenicol	29	43.94
Trimethoprim	16	24.24
Colistine	16	24.24
Levomycline	12	18.18
Cep		
Sulf		
Tetr		
Oxytetracycline	6	09.09
Ampicillin	5	07.58
Kanamycine	2	03.03
Gentamycine	2	03.03
Rifamycine	1	01.52

All of these antimicrobials are allowed for use in aquaculture by the Department of Animal Health

Viet Nam

Nursery and Grow-out

- Antimicrobials are applied by feed incorporation;
- Dosage: most farmers often use antimicrobials upon instructions of the drug dealers, thus are not aware of the actual dosages that they have used or using;
- Treatment duration ranged from 1 to 7 days, with 3 days treatment as the most common;



Viet Nam

Nursery and Grow-out



- Withdrawal period for the used antimicrobials prior to harvesting at the commercial farms is 120 days on the average;
- Commercial farms producing pangas catfish for export stop using antimicrobials earlier (when cultured stock reached 500-600 g) compared to farms producing fish for domestic consumption;



Vietnam

Nursery and Grow-out

- Nursery farms used antimicrobials much more frequently and continuously than grow-out farms, until the seedlings were sold to middlemen or grow-out farms;
- Very limited number of farms use prescription from certified veterinarian before they purchase any antimicrobials;



VINH HOAN **PHIẾU XÉT NGHIỆM BỆNH CÁ** BM09/QT02
Lần soát xét: 03 (12/07/16)

Nguồn mẫu: Vồng muối Tân Khánh Trưng
Địa chỉ: Ấp Tân Bình, xã Tân Khánh Trưng, huyện Lập Võ, tỉnh Đồng Tháp.
Loại mẫu: Cá tra. Ký hiệu mẫu: ao 08
Ngày nhận mẫu: 10/07/2017
Tình trạng mẫu: mẫu tươi

KẾT QUẢ XÉT NGHIỆM

1. Biểu hiện bên ngoài

Cơ quan	Da	Đầu	Mang	Mắt	Vảy bụng	Hậu môn	Đuôi
Tình trạng	Xuất huyết	Bình Thường	Bình Thường	Đục đỏ	Xuất huyết	Sung đỏ	Xuất huyết

2. Mô khám bệnh tích

Cơ quan	Dạ dày	Gan	Thận	Túi mật	Lách	Ruột	Bong bóng
Tình trạng	Bình Thường	Xuất huyết	Xuất huyết	Đen sẫm	Bình Thường	Đầy thức ăn	Bình Thường

3. Kỳ sinh trùng

Loại ký sinh	Sân lá mang	Trùng mặt trời	Trùng quả dưa	Rận cá	Nấm thủy mi	Guan tròn	Trùng lông	Sân lá gan
Mật độ nhiễm	0	0	0	0	0	0	0	0

4. Kháng sinh đồ

Kết quả nuôi cấy trên thạch: MHA
Phạm vi thử: Florphenicol, Trimethoprim, Sulfam
Kháng sinh nhạy: Florphenicol, Trimethoprim, Sulfam
Quyết định điều trị:
- Kết luận bệnh: Xuất huyết
- Tên thuốc: Vime fenfah
- Lượng sử dụng: 0,041lit/ 80kg thức ăn/ngày.
- Thời gian sử dụng: Từ ngày 11/07/2017 đến ngày 15/07/2017.
Quyết định bắt giông:
Cần bỏ ngư y

Ngày 11 tháng 07 năm 2017
Nhân viên xét nghiệm

Nguyễn Kim Ngọc Thành
Phạm Thị Thủy Em

Ghi chú: - Kết quả xét nghiệm chỉ có giá trị trên mẫu thử
- Để mẫu đại diện cho cá bệnh trong ao cần số cá xét nghiệm tối thiểu là 10 cá/ ao

Viet Nam

Nursery and Grow-out

- Most farmers can buy antimicrobials from local veterinary drug stores even without prescription.



Vietnam (Other Chemicals)

- Due to the wide use of antimicrobials in most culture operations, few nursery and grow-out farmers use other chemicals and compounds including:
 - Probiotics
 - vitamins (C and B12)
 - herbal extracts (e.g. Yucca extract)



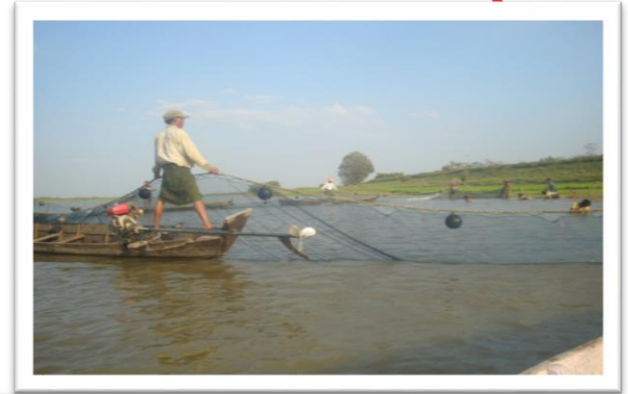
Myanmar



There is no record of antimicrobial use in Myanmar due to:

- **most fish farmers are practicing extensive culture system; and,**
- **many are not aware on AMU and AMR.**

An awareness seminar on AMU and AMR was undertaken instead.



Myanmar



AMU/AMR Awareness in Myanmar

The seminar was attended by:

- 30 freshwater fish farmers (from Yangon and nearby aquaculture areas);
- 2 DOF officers;
- Staff of Yangon University;
- Officers of Myanmar Fisheries Federation



Myanmar



AMU/AMR Awareness in Myanmar

Topics presented to the fish farmers in local language:

- ***Antimicrobial Use and Antimicrobial Resistance in Aquaculture*** (Dr. E. Leaña, with simultaneous translation to Burmese by Dr. K.L.Tun)
- ***Freshwater Fish Disease and How to Inform the National and Competent Laboratories*** (Dr. Tun)
- ***Biosecurity in Aquaculture*** (Dr. Leaña)



Myanmar



AMU/AMR Awareness in Myanmar

Topics presented to the fish farmers in local language:

- **Special lecture on Tilapia Lake Virus** (Dr. Leaño, as per request of the farmers)
- **Water Quality Parameters in Aquaculture** – with a hands-on demonstration on how to measure basic water quality parameters (Dr. Tun)



Myanmar

AMU/AMR Awareness in Myanmar



- Participants were then requested to fill-up the questionnaire that was developed for AMU survey (translated in Burmese).



ပဋိပက္ခဝေပေးပါးအသုံးပြုသူများ၏စေတနာမှ

ငါးကနု၏အိမ်ကုအလကုမ်း ။

ကနုအမည်			
လိပ်စာ			
ကနုပိုင်ရှင်အမည်			
မြေဧကအရင်းအမြစ်	ကနုအကိယ		
မြေဧကပုံစံ	<input type="radio"/> သားပေါက်စခန်း/ သားဖော့ကွၼ် ရောငါးရဲခင်း	<input type="radio"/> ငါးသန့်ရောငါးရဲခင်း	<input type="radio"/> အကောင့်ခက်မီးမြေရဲခင်း
	<input type="radio"/> ကနုဖျော့ခင်း/ရောငါးရဲခင်း	<input type="radio"/> အအေးခန်းသို့/ပို/အရင်း	<input type="radio"/> အရဲခင်း
	<input type="radio"/> Extensive (ကနုကိယ)	<input type="radio"/> Semi-intensive အစားအနုညှိငယ်ကော့ဖျော့	<input type="radio"/> Intensive အစားအနုညှိကနုရောငါး ရောငါးရဲခင်း



Myanmar



- Although it is already given that no antibiotics are used in Myanmar for fish culture, they were instructed to include the other chemicals that they are using in the farms.
- Other chemicals used for pond preparation and water treatment/disinfection include:
 - lime (CaO);
 - dolomite (CaMg(CO₃)₂);
 - CaCO₃;
 - CaOH;
 - For treatment of parasitic infestation, most farmer just use salt (NaCl)



ပဋိပက္ခိဝေဆာဝါးအသုံးပိုသုံးမိ၏စေတမ္မာ

ငါးကုန်၏အခဲကုအလကုမ်း။

ကုန်အမည်			
လိပ်စာ			
ကုန်ပိုင်ရှင်အမည်			
မျှော်ထားသော ငါးအမီးအစား	ကုန်အက်ယူ		
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	<input type="radio"/> Extensive (ကုန်လွယ်)	<input type="radio"/> Semi-intensive အစားအနည်းငယ်ကုသခြင်း	<input type="radio"/> Intensive အစားအနည်းငယ်ကုသခြင်း



Indonesia



Grouper farms surveyed for AMU in Indonesia

Province	Hatchery	Nursery	Grow-out
Riau Province			
Batam		1	15
Bintan			7
Ananbas	1		4
Natuna			6
Pesawaran	2		4
TOTAL	7	1	40

Results of the survey are still being analyzed and summarized.

Indonesia

AMU survey in Indonesia



Riau and East
Java



Indonesia



AMU survey in Indonesia



**Riau and
Lampung**



SUMMARY

- ❖ Antimicrobials are commonly used in the shrimp hatchery operations in Thailand, while only few grow-out farmers use antimicrobials within the first month of culture;
- ❖ For pangas catfish, antimicrobials are widely used in both nursery and grow-out operations;
- ❖ Commonly used antimicrobials are oxytetracycline (for shrimps) and amoxicillin, doxycycline and florfenicol (for pangas catfish);



SUMMARY

- ❖ Most farmers use antimicrobials that are approved by the proper authority of the country for use in aquaculture operations;
- ❖ Sufficient withdrawal periods (2 months for shrimps and 4 months for pangas catfish) are practiced by farmers, to make sure that the harvested products are free from any antimicrobial residues; especially those that are intended for export;
- ❖ The non-usage of antimicrobials can be correlated to the increased number of alternative chemicals, biological agents and feed supplements that are being used by the farmers to improve health of cultured stocks and to prevent diseases.



Thank you!

