



Food and Agriculture Organization
of the United Nations

Enhancing capacity/risk reduction of emerging Tilapia Lake Virus (TiLV) to African tilapia aquaculture

Nagadya Rose Melissa.

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Socio-economic impact assessment

Outline

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4. Macroeconomic analysis of Tilapia Lake Virus (TiLV) Economic impacts of Fish.
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 - Models to be used
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OBJECTIVES AND SCOPE OF THE STUDY

1. One of the objective of the study is to analyze and evaluate the social-economic impact of the Tilapia Lake Virus (TiLV) and its effect to both the community and country's economy.
2. To examine the would be outbreak effects on the country's revenue and community activities.
3. To strengthen/create the regional economic bodies in monitoring and reducing the virus movement
4. To sensitise and create awareness

Current situation of the Tily in Africa

- Its confirmed there is a threat! Implying that action must be taken to analyse and plan a better approach of how to tackle the emergency.
- It is very vital for the community and decision makers to know how serious is the risk and how much this would impact both the community and country's revenue.
- Due to the fact that our project countries have not yet announced though indicated a threat, we will use various approaches as indicated in the presentation.



The Economic importance of fish

- Tilapia now almost everywhere around the world (140+ countries farming it)
- Aquaculture ~ 6.5 million metric tonnes (2017)
- Capture fisheries <1 million tonnes (2017)
- 2018 sales to reach > \$12,000,000,000
- Exports of fish & products exceed those of meat, dairy, Cereals, sugar, coffee, oilseeds, etc.
- In many developing countries foreign exchange comes from fish exports finances other food imports

Demand for Fish

- Present global production of food fish 115 million tons
- Demand for fish increased at twice population growth over last 50 years
- Estimated additional 20-30 million tons required to meet demand by 2020; could be an underestimate
- Per capita consumption increased from 11.5kg in 1970 to 12.5kg in 1980 to 14.4kg in 1990 to 17.0kg in 2008

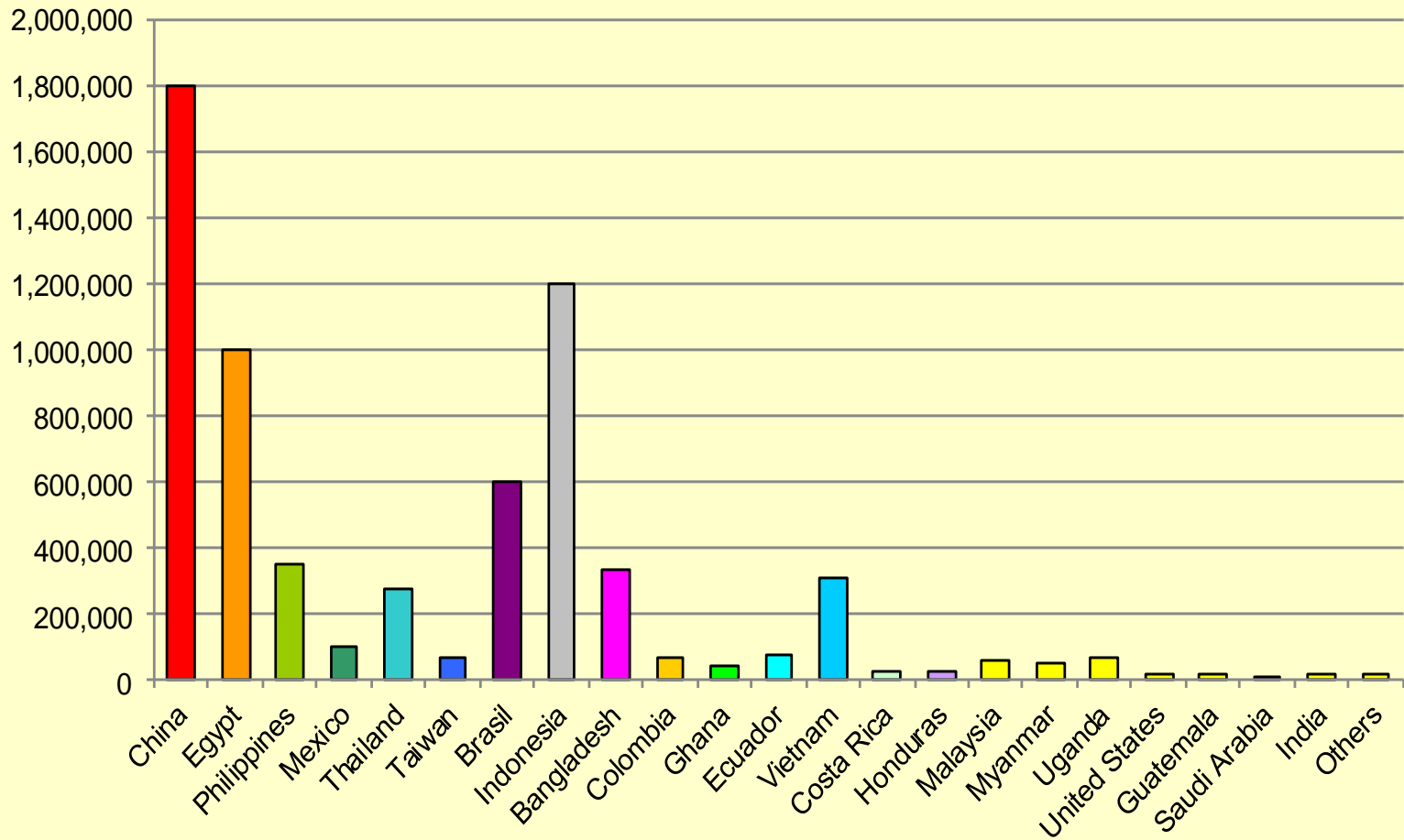
Macroeconomic analysis of Tilapia Lake Virus (TiLV) Economic impacts of Fish.

- **Economic key indicators**
- The Economics indicator measures the contribution of fish to the country's economy. It indicates the Economic gains accumulate within the value chain, including the values and profits for a given period of time. The Indicators we will look at include,
- **Fish Contribution to the National GDPs for the last 5-10 years**

NATIONAL GDP APPROACH

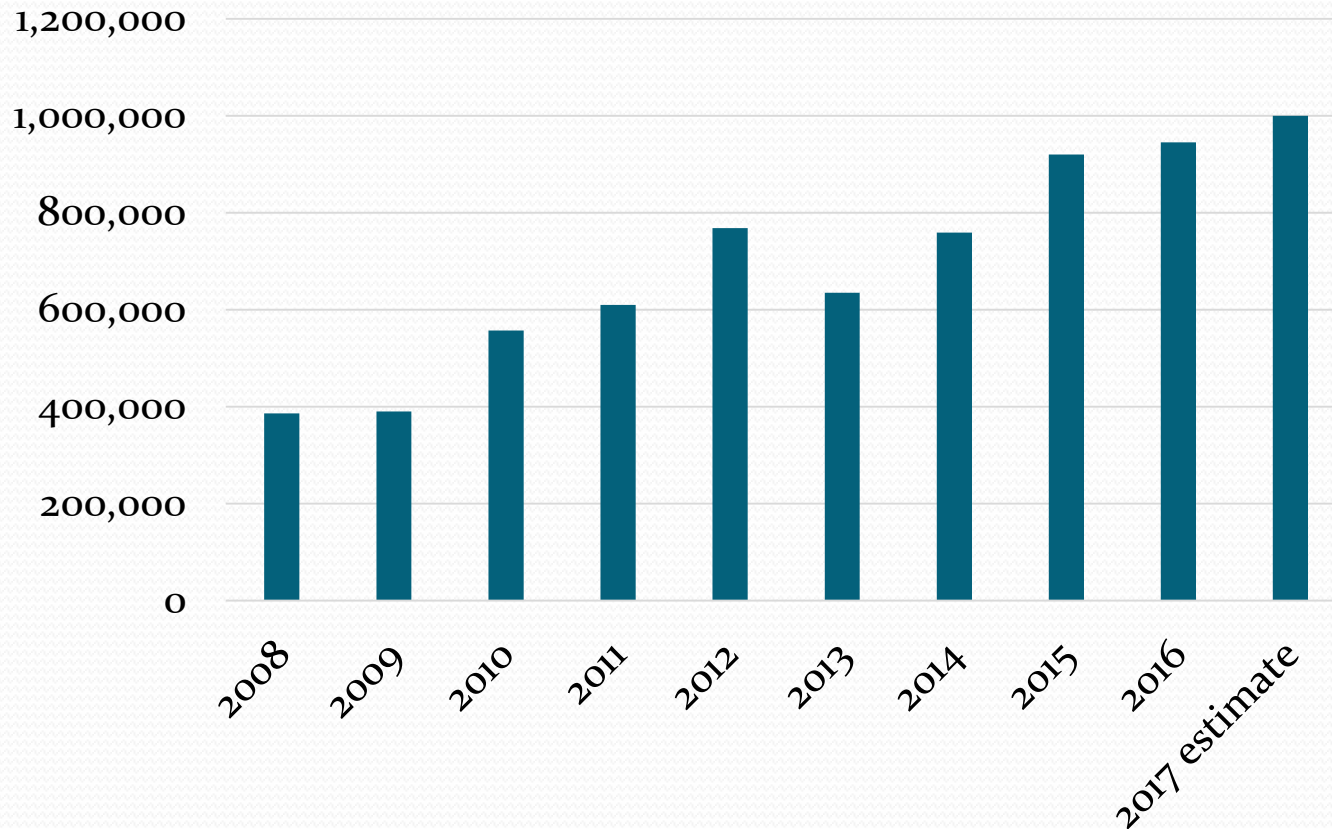
- Gross Domestic Product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period. GDP per capita is often considered an indicator of a country's standard of living.
- Based on the collected data and results, we will proceed and use this data to estimate the would be level of impact on fisheries direct contribution to GDP. This will then support to affirm the would be Economic impact of the Disease outbreak fish.

World Tilapia Production of 6,510,700 mt in 2017



African Champion (Aquaculture): Egypt

Metric tons – largely for domestic consumption





How to Estimate the GDP

- **A common way to estimate GDP** is the “production approach” through the calculation of the Gross Value Added (GVA) whereby:
- $GDP = GVA + Taxes - Subsidies$. However, data on taxes and subsidies must be available.

Estimate production cost

- The production cost depends on the type of vessel or operational unit, i.e. production cost of a dugout Non-motorized canoe is less compared with that of a 12 meter planked motorized canoe. For the Purposes of this study, national experts will be requested to specify the annual production cost by type of fishery, excluding labour and capital costs, and taxes.
- *Production cost = Operating Expenses (fees, fuel, maintenance and repair)*

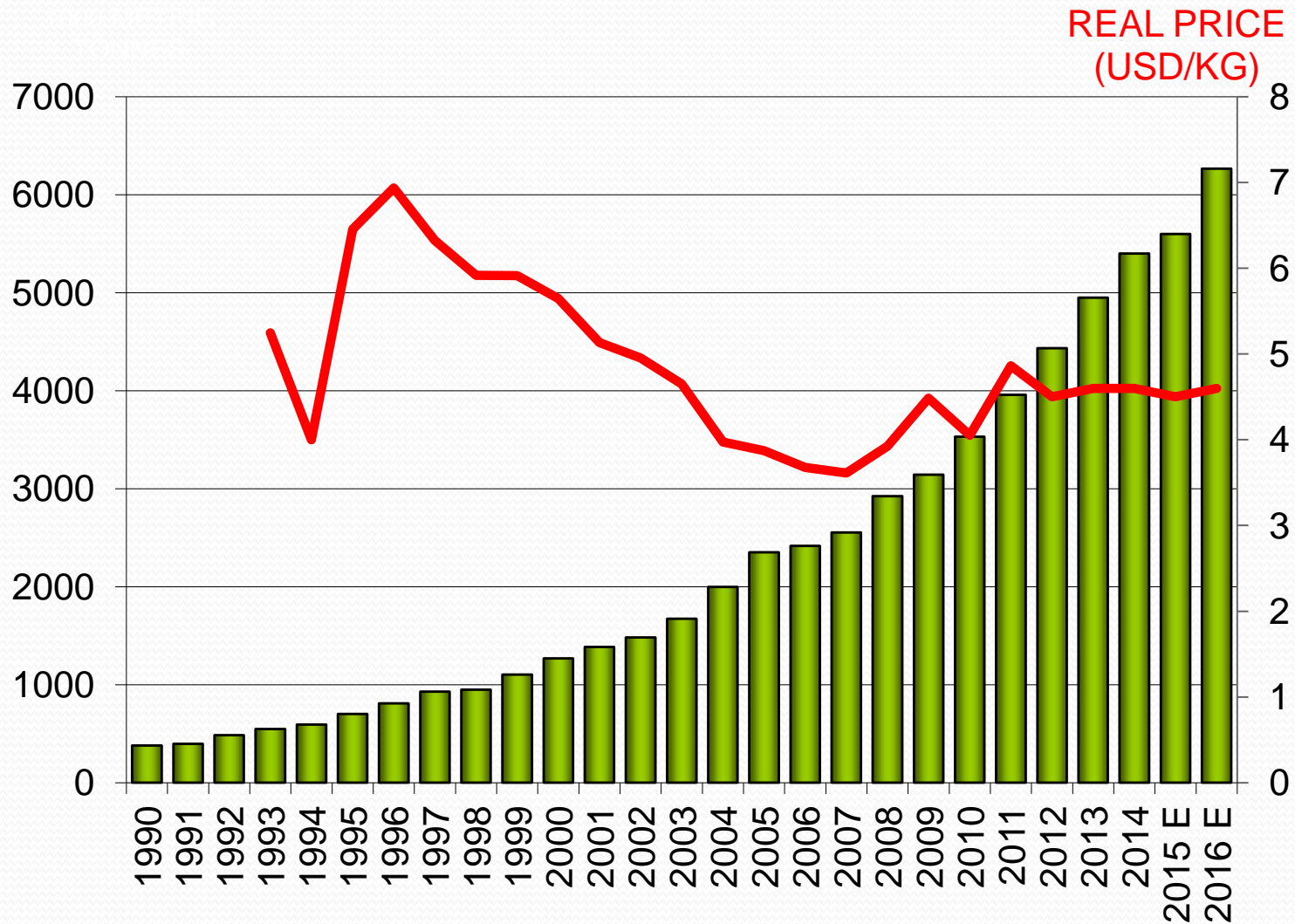
• Economic key indicators

Example of the fish Contribution to the National GDPs

Country	Fish GDP 2013	2014	2015	2016	2017	Estimation 2018-2019
Angola						
Uganda						
Ghana						
Nigeria						
Kenya						
Egypt						

Based on the collected data and results, we will then use this data to Estimate the would be level of impact on fisheries direct contribution to GDP. This will then support to affirm the Economic impact of the Disease outbreak fish

Tilapia Global Aquaculture Production



Cont... of Economic key indicators

- Country level of production for the last 5-10 years,

Country	Fish 2013	2014	2015	2016	2017	Estimation 2018-2019
Angola						
Uganda						
Ghana						
Nigeria						
Kenya						
Egypt						

Based on the shared country Data, on both Production and GDP, We will then incorporate the **Risk and Sensitivity Analysis** (What would be the estimated impact of the virus outbreak on the economy)

Methods to be used.

Incorporate the Risk and sensitivity analysis

- The Risk and sensitivity analysis incorporation

Due to the fact that the Tilapia Virus status is still a Treat at the moment, with no counties yet officially announcing its presence, the model to be used in this case is the the Sensitivity Analysis. After Analyzing and Estimating the expected Effect on both the GDP and the National production. This will be key for the study since it will also support decision makers and create awareness regarding the Virus Threat to both the community and Economic environment.

- It is an approach which determines how different values of an independent variable affect a particular dependent variable under a given set of assumptions. This technique is used within specific boundaries that depend on one or more input variables, such as the effect that changes in the production levels (independent variable) has on bond prices (dependent variable).

Example of Sensitivity Analysis

- Assume Mr Kagere, a Farm manager, wants to understand the impact of the disease outbreak on his total production. He determines that sales are a function of price and production volume. The price of 2 tonns of Fish is \$2,000, and Kagere sold 200 last year for total sales of \$200,000. Kagere also determines that a 20% decrease in supply. Due to the disease outbreak this causes an increase in demand due to low volume by 10%, which allows him to plan a better option in his sales and to build a business model and sensitivity analysis around this equation **based on what-if statements**. It can tell him what happens to sales if production decrease and when the Disease outbreak spreads wider with a loss by 20%, 50% or 100%.
- Based on 100 tonnes today, a 20%, 50% or 100% decrease in production equates to a decrease in sales by 10%, 25% or 50%, respectively. The sensitivity analysis demonstrates that sales are highly sensitive to changes in Production and this has a big impact on the whole value chain.

Sensitivity and Scenario analysis

- **Scenario analysis** (What would be the **estimated Impact on the economy**) This is the process of estimating the expected value of a threat after a given period of time, assuming specific changes in both the economic and social aspects.
- This analysis is commonly used to estimate changes to key area Variables in response to an unfavourable event, and may also be used to examine a theoretical worst-case scenario. This process is mostly used to estimate changes in revenues and community values

Why/what are benefits of Scenario Analysis

- **Future planning** – The Scenario analysis gives planners/ decision makers a peek into the expected returns and risks involved when planning for future investments. The goal of any farm/investment is to increase revenue over time, and it is best to use informed calculations when deciding and making plans
- **Reduce/limit on the would be wide spread of a diseases.** Thanks to early projection and planning, In the case of the Tilv scenario, countries would be already sensitised and informed on the better approach
- **Proactive** –Farms can avoid or decrease potential losses that result from uncontrollable factors by being aggressively preventive during worst-case scenarios by analysing events and situations that may lead to unfavourable outcomes. As the saying goes, it is better to be proactive than reactive when a problem arises.
- **Avoiding risk and failure** – to avoid poor economic decisions, scenario will analysis allows businesses or investors to assess investment prospects. It takes the best and worst probabilities into account so that investors can make an informed decision.

The Social Impact Assessment

- The Fishing sector in most of the African countries including the Project countries are both economically and socially dependents on the Fish value Chain as it will be indicated.
- Social impacts are the effect of an action, or event, on a society/community, family or individual directly or indirectly. These effects may have both positive or negative consequences, and impacts a range of different social variables describing a community's or person's wellbeing. There are a various types of approaches for measuring social impacts depending on which scenario is being considered and which stakeholder group.

Social Impact models

- During this study, we will be using various approaches including, the **Social Impact Analysis Model (SIA model)** Which will analyze how much impact the TiV outbreak would have on the community and economic level.
- In the Case of Aqua culture, the model is designed to predict changes in well-being. Well-being refers to the degree to which an individual, family or larger social grouping (e.g., firm, community) can be characterized as being healthy (sound and functional), happy, and prosperous.

Social benefits of Tilapia



This creates Employment, Food security, Gender empowerment, and crime reduction, community well being done?

The key Variables in the Social Impact

1. Employment

- Employment is an essential component of human well-being and an important indicator for decision makers in development. In the case of the TiV outbreak, this will have a big impact in all project country's this analysis will look at collecting the employment data generated by the whole fisheries and aquaculture sector, by analyzing how this Population will be affected by the Virus outbreak and its impact
- Under the employment indicator, we will be looking at the Number of People Employed along the Fish Value chain. Each country might have the same or different value chain. The key data required is the number of actors involved in the process.
- Depending on each country's specified type of Value chain. our key interest will be the Number of people employed along each value chain level.

Types of global fishery value chains

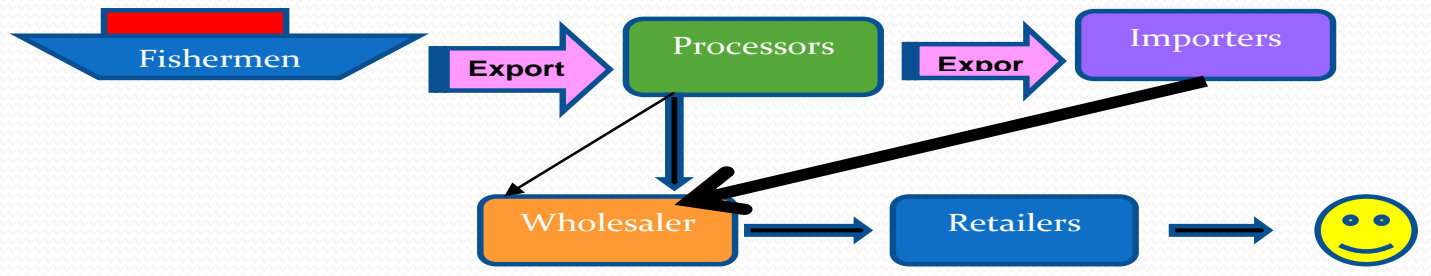
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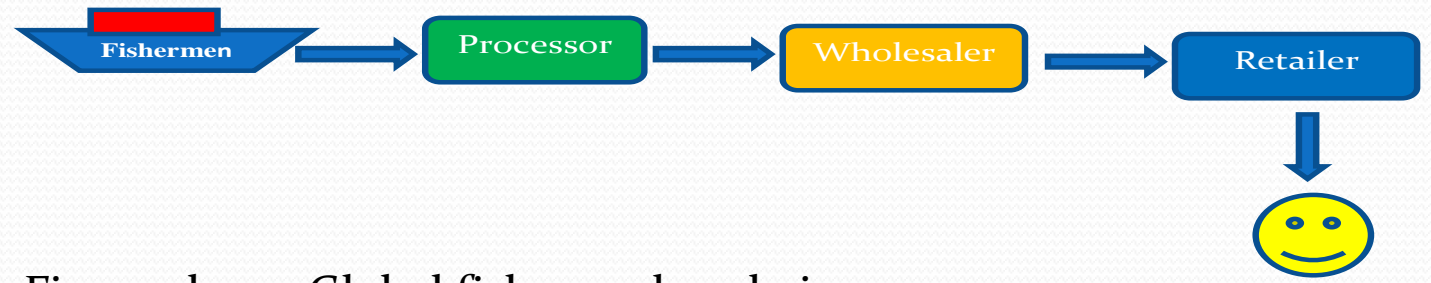


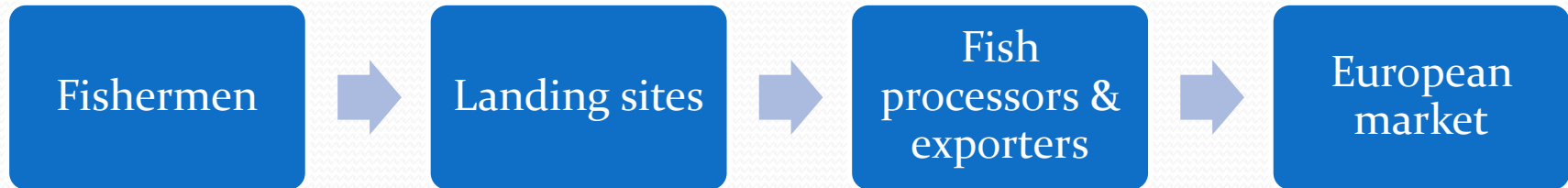
Figure above Global fishery value chains

Stakeholders employed along the fish value chain

Stakeholder involved	Role	Number of employees
➤ Producers	Supply fish to cater for consumer demands	?
➤ Input suppliers	Supply fish input to clients	?
➤ Fishermen and fish farmers	Capture fishery	?
➤ Processors	They Prepare, clean and pack the fish	?
➤ Distributors and traders	Store and sell products to retailers	?
➤ Retailers	Sales of domestic fish products	?

In regards to the TILV Project countries, A large number of people find employment in fish marketing as fishermen, assemblers, processors, traders, intermediary transporters and day labourers, including women and children. In this scenario, the numbers of employment are high

An example of a fish value chain in Uganda



In this case, this is an International value chain(High employment chain). At the International market level, Stakeholders follow different strategies to maintain healthier ties with producers and markets. The value addition at this level, is always higher since Profit maximization and distribution are considerably high in short supply chains i.e. chains managed by private businesses entrepreneurs, NGOs and supermarkets which is all linked to employment levels.

Fishing sector Employment per country

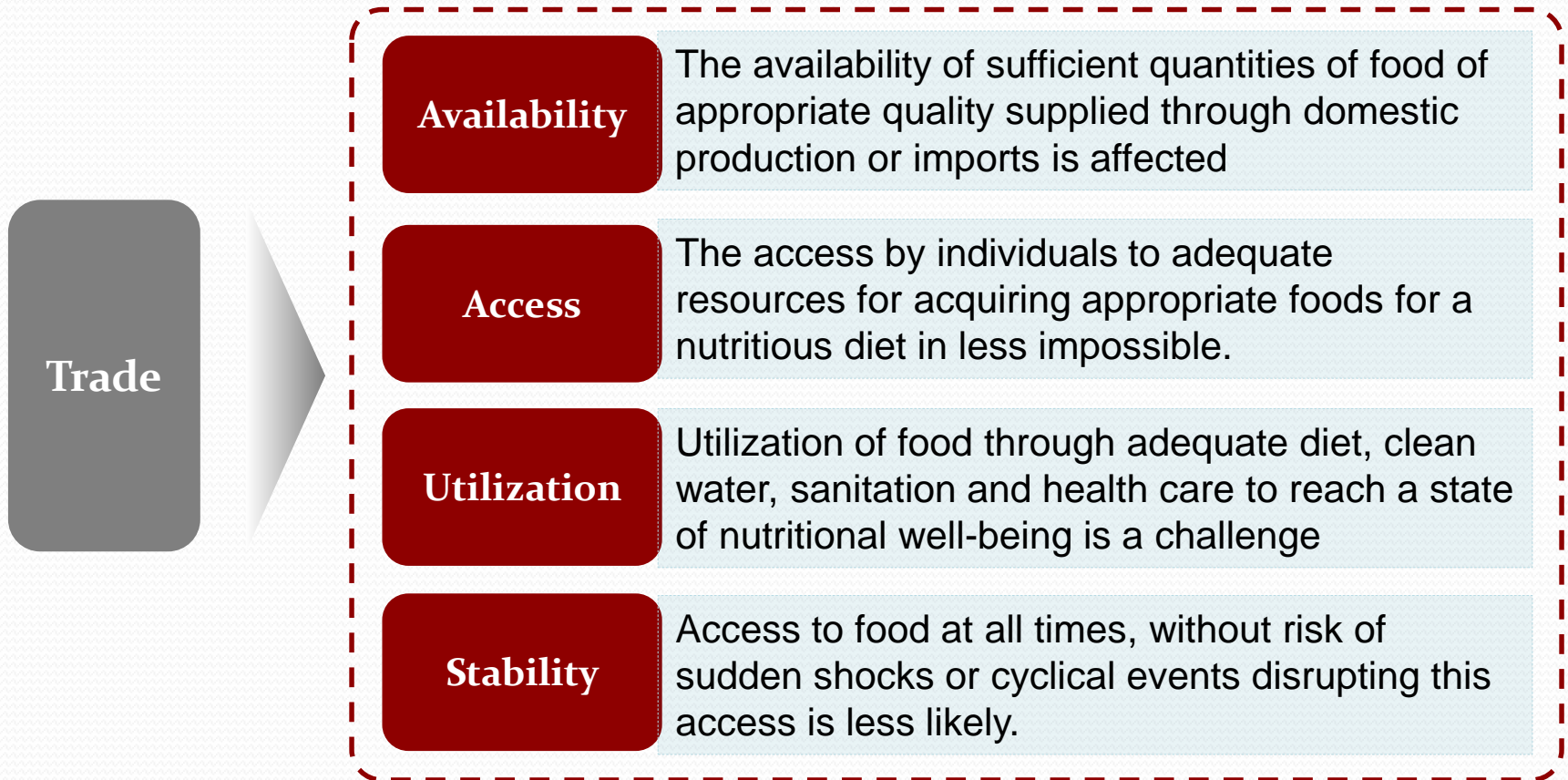
- We will look at each country Fish employment numbers of both Men and women
- Kenya
- Uganda
- Ghana
- Angola
- Nigeria
- Egypt

2.Livelihood/ welfare (Food security)indicator

- Globally over 540 million (15% of population) involved in fisheries & aquaculture; growth more than population & employment in traditional agriculture, Fisheries and Aquaculture provides primary source of income 80-100% of rural aquaculture products sold generating cash for families, Cash generated used for buying other necessities, Brings in foreign exchange.
- On Food security, Fish is “Rich food for Poor”; cheapest animal protein , Provides animal protein to a number of people globally; in the both developed and the developing world.

How does the Outbreak affect the linkages between trade and food security

In food security, with the threat of the Tilapia outbreak Virus, there is risk on the 4 key dimensions of trade. The impacts can be positive or negative, with trade affecting different variables in the short, medium and long terms.



More Social indicators



- Gender(Post harvest)
- School feeding Programs.
- Healthy Risk(We may need to analyze the Healthy impact this may have on the community)

Way forward.

1. Identify community/ farms who earn a living on any of the Fish activities,
 - Producers,
 - Fishermen
 - Processors
 - Traders,
2. Follow up with the necessary data requirements at the country level...
 - National GDP, (fish contribution)
 - Trade and Employment Data
 - National Fish Production data
 - Gender (Number of Men and women involved and their contribution)

Questionnaire Interview Guide

- **DEPENDING ON THE BUDGET**
- The plan is to conduct interviews at country level between.....Each interview will last
- Draft semi-structured interviews will be shared
- Most questions are multiple-choice style; other questions only require very short answers. The questionnaire contain a section where the participants are asked to provide their name and phone number in case of ambiguities when working with the data.

Recommended Data links

- <https://data.worldbank.org/indicator/ER.FSH.PROD.MT?locations=AO-EG-GH-KE-NG-UG>
- <http://www.fao.org/in-action/globefish/countries/en/>
- <http://www.fao.org/giews/reports/special-alerts/en/>



Many Thanks.
Grazie.
Asante sana.