## Title of innovation

Climate smart farming of tilapia

## The situation/ Background

Aquaculture is an important source of animal protein for Egyptian consumers. Aquaculture production represents 80% of local fish production. Open pond culture farming produces 85% of farmed fish in Egypt. Tilapia is the main farmed species, 67% of production. Globally, Egypt is the third producer of tilapia after China and Indonesia. In spite of the success achieved in aquaculture, there is a risk of declining production due to limitation of water resources. On the other hand, the population increase at 2.5% annually, which required steady increase in fish supply for food security. No genetic selection program conducted for improving cultured fish performance.

## The Drivers of the innovation / the problem

Climate change and population increase contribute to reduce water availability and quality for fish farming. This will lead to reduce farmed fish production. On the other hand, there is a need for food security of growing population demand. Developing climate smart aquaculture system became an urgent need for food security and protecting the environment. In-Pond Raceway System (IPRS) is a climate smart aquaculture that enable increase yield, improve water use efficiency and reduce global gas emission. The seasonality of fish production and short growing season created an urgent need for stocking fast growing fish, to reach market size during growing season.

## Description of the innovation

The In-Pond Raceway System (IPRS) is the culture system that recycle water within the pond with no need to exchange water during culture season. The system require establishing a cell inside ponds and creating water current in the cell. The open pond area subdivided by dikes to allow full circulation of the water through the raceways and around the entire pond before re-entering the raceway cells. The water current carry solid waste outside the cell. Solid waste is pumped out from culture system for other uses to reduce the GHG emission. Culture of genetically improve tilapia achieved very good result.

## The Challenges faced

The main challenges faced can be summarized in the following: (1) limited knowledge on tilapia culture performance in such under IPRS system; (2) lack of experience of system design and construction; (3) domestication of technology for the production of equipment needed for the system (e.g. Airlift unit); (4) detail of system design and fittings; (5) system management such as water current speed waste management, (6) practical experience of life fish handling; (7) high construction costs.

## The impact of the innovation especially on small holder farmers, youth and women.

The IPRS system will increase fish productivity and farm revenue. This system will increase production and increasing food availability for consumption and improve nutritional status of the communities (including women and youth). Scaling of IPRS culture system will generate more job especially among youth and fresh graduates (especially those studied in faculty of fisheries) due to their skills and education. Also, increasing fish production will create more job opportunities in fish retail and processing especially for women, who represent a significant percentage of work force in this segment of the chain.

## The potential of scaling up or replicating the innovation

The IPRS is a climate smart aquaculture that enable working under adverse limitation of water resources and reduce global gas emission from pond aquaculture. This system will enable aquaculture sector in countries such as Egypt, Iraq, Syria and many African countries to produce fish even though the scarcity of water due to climate change and pollution. Large scale adoption of the IPRS will enable double aquaculture production within 10 years to increase food supply to meet the growing demand due to population increase. Number of IPRS cells increased by double in 2019 and expected to double again in 2020.

## The name of the story presenter at the Forum

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Please attach to this template relevant pictures of the innovation/ success story.

References and evidences

1. Important Reference:

Publications


Communication material


2. Figures and pictures

2.1. In-Pond Raceway layout showing system components (Designed by: Ahmed Nasr-Allah)

2.2. General picture for the IPRS pond (WorldFish)
2.3. Picture for the low cost IPRS system during operation in 2018 (WorldFish)

2.4. Feeding fish in the IPRS system in Abbassa (WorldFish)
2.5. Sold waste collection from the IPRS system in WorldFish

2.6. Harvest day for the IPRS culture system in August 2018 (WorldFish)
2.7. Vice Minister and US Ambassador visit to the IPRS in WorldFish

2.8. Participant in training from Africa assist harvest of IPRS