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S. Sectoral Working Group sessions: S2 Enhancing sustainable aquaculture in freshwater ecosystems of Latin America

Climate change and fish farming

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The knowledge of the environmental impact of an activity can be seen as a market differential. Agricultural activities such as cattle raising have been heavily taxed because they are considered high greenhouse gases (GHG) emissions, forcing the market to adopt mitigating measures. Little is known about its emission and its real impact of aquaculture on climate change. The increase of GHG in the atmosphere results in alterations like the increase of the temperature and changes in the precipitation with direct effects in the aquaculture as alterations in the growth, reproduction and fish mortality. A pioneer work was done to quantify methane (CH4) and carbon dioxide (CO2) fluxes of fish farming areas with Nile tilapia (Oreochromis niloticus) in net cages. The GHG fluxes were measured in fish farms at the tropical reservoirs Furnas (FHR), Castanhão (CAS) and Chavantes (CHV). The CH4 was classified by the mechanism for gas transport through the water column as diffusive flux or bubble flux. The comparison between the points with fish net cages and control (without net cages) in FHR and CHV suggest that fish farming did not impact the emission of CH4 by diffusive transport. In the CAS, high CH4 diffusive fluxes were observed in sites with fish net cages. The mean CH4 bubble flux in CAS and CHV was higher in areas with fish net cages when compared to areas free of fish production suggesting the influence of fish farming on the CH4 bubble fluxes. In the FHR, the decrease in depth during the drought period was associated as the factor with the greatest impact on the CH4 bubbles emission. The CO2 sink in CAS and emission in CHV suggest that characteristics of the reservoir, as chlorophyll-a and turbidity have a greater impact factor to CO2 emission than the fish farming.

Keywords: Greenhouse gases, fish farming, tropical reservoirs, climate change