

# The effects of warning information about flow conditions on the performance of river cage aquaculture in the Nan River, Northern Thailand

Pathairat Pastpipatkul<sup>b</sup>, Pawassada Pratumvan<sup>b</sup>, Manoj Potapohn<sup>b</sup>, Louis Lebel<sup>a,\*</sup>

<sup>a</sup> *Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai, Thailand*

<sup>b</sup> *Faculty of Economics, Chiang Mai University*

---

## ARTICLE INFO

---

### *History:*

Draft: 4 Dec 2015

Incomplete draft.

---

### *Keywords:*

climate change,  
extreme events,  
early warning systems,  
aquaculture,  
Nan River,  
Stochastic frontier  
Water management

## ABSTRACT

---

Discharges in the Nan River below Sirikit Dam are strongly influenced by dam operations as well as seasons and extreme climate events. While river-based cage aquaculture is able to cope with a range in flow conditions, extreme low or high discharges are detrimental as they damage cages and kill fish. Early warning information about flow conditions is important to fish farmers under these conditions. This study looked at the information fish farmers receive, how they respond to this information with actions to reduce risks of losses, and the impacts of taking action on warnings for farm performance. Data was collected from 303 fish farms. The findings showed that fish farmers received messages from multiple sources, but that the information provided was often difficult to understand or unreliable. Nevertheless, warning messages were seen as important to reduce risks and helped predict actions taken.

---

\* Corresponding author

*E-mail address:* [louis@sea-user.org](mailto:louis@sea-user.org) or [llebel@loxinfo.co.th](mailto:llebel@loxinfo.co.th) (L. Lebel).