Hydrological extremes and food security in western Amazon

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Hydrological extremes and food security in western Amazon

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Does hydrological variability in western Amazon impact food security?

Data: Data from enquiries in markets and shops of the little towns along the Solimões River, data from the Peruvian Ministerio de Agricultura y Riego, hydrological data from the Observation Service SO HYBAM “Geodynamical, hydrological and biogeochemical control of erosion/alteration and material transport in the Amazon basin”

Methodology: enquiries, statistical analysis

1. A very important seasonal water level variability is observed in western Amazon (mean range = 9m, Fig. 1).

During the low-water season (from August to November), agriculture is possible on the banks of the rivers (Fig. 2) and in the flooding plains (Fig. 3). Fish is easier to catch in the remaining pools (Fig. 4) and hunting in large territories is more difficult. On the contrary, hunting is easier during the high-water period when the animals are trapped. As a consequence, the availability and price of food vary seasonally.

2. An important water level interannual variability produces intense droughts and flooding (Fig. 1, Espinoza et al. 2013, for instance). It may produce food price peaks (Tables 1,2,7) as during the big 2009 and 2012 flooding: the need to import tomato from Peru (Fig. 5), while the price of industrialized products is more difficult. On the contrary, hunting is easier during the high-water season when the animals are trapped.

A rapid filling of the river (type 4, Fig. 8) speeds up the cassava crop and brings about the production of farinha (May 2015, Campo Alegre, Brazil). Does a brief low-water period (type 2, Fig. 8) allow or not the ripening of the crop and good yields in areas subject to seasonal water level variability (from August to November), agriculture is possible on the banks of the rivers. Does hydrological interannual variability in western Amazon impacts food security? How will it impact food security under climate change?

What is the impact of a long-lasting low-water season (type 3, Fig. 8) on transport (Fig. 9) and on food prices?

1. The prices of local food are lower during the low-water period i.e. during the period of production (Fig. 5), while the price of industrialized products does not change much (not shown).

2. Fish offer is higher during the low-water period while the supply of wild meat (dear, peccary, paca, etc) is higher during the high-water period (Fig. 6).

Conclusions: During the low-water period, agriculture products and fish are abundant and inexpensive while wild meat is not available.

Perspective: How does hydrological interannual variability in western Amazon impacts food security? How will it impact food security under climate change?

References: