Rural-urban migration in Jiangsu province, China in response to the unemployment gradient: A Socio-hydrological Approach

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As one of the fundamental behaviors of human, migration can be understood as an active adjustment of the spatial distribution of population, often in response to water stress. Water resources dynamics, a basic element for civilization development, slowly but firmly imposes its potential force on every aspect of human activities. We study the phenomenon of increasing migration from rural areas to cities and towns, specific to Jiangsu province in China, in response to rural and urban unemployment rates over 15 years from 1999 to 2013.

Located in the south-east region of China, Jiangsu province features its high density of population and high frequency of migration from its rural to urban areas. First, rural-urban migration rate for the aforementioned period is calculated based on census data on population, fertility and mortality rates of rural and urban areas of the province. The fluctuating net migration rate from its rural areas to cities shows a general positive trend - 2 peaks in years 2000 and 2010 respectively. In order to interpret this trend, we model labor demand in the agricultural sector that dominates rural areas based on a Cobb-Douglas production function, and confront it with labor supply data to generate the unemployment rate in the rural areas of Jiangsu (U_a). With the observed dataset of urban unemployment rate in Jiangsu (U_c), the difference between unemployment rate in cities and rural areas (U_a- U_c) is obtained and compared with the migrating population from rural areas to cities.

The result shows that from 1999 to 2004, migration towards cities increases when U_a- U_c decreased, which means the employment rate in cities was higher than rural areas. The migration also decreases when the difference of unemployment rate shrank. This may support a hypothesis that migration responds to gradient in employment opportunities. However, from 2005, onward migration to urban areas continued to rise in spite of higher unemployment in urban area.

Thus, it appears the phenomenon of increased rural to urban migration cannot be confidently interpreted as a consequence of the unemployment gradient based on the current availed datasets and model used. It is therefore necessary to explore the unknown potential feedbacks which would impel the unusual movement of people. Some preliminary results of an improved socio-hydrological model in this direction will be presented that figures out 'unknown' feedbacks between water resources, agricultural and industrial production, and human migration trend in Jiangsu.