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## **Cuba metabolism reconfiguration after the collapse of the Soviet Union**

**Klein, Jérémie; Bouffange, Albert; Courtonne, Jean-Yves; Mandil, Guillaume**

It is rare for a country's economy to suffer a sharp contraction in its supplies of raw materials essential to its metabolic functioning. One of the rare cases in history is Cuba in the 1990s. After the collapse of the USSR in 1991, which was Cuba's main trading partner, the island saw its imports of several raw materials plummet. Major changes were made to cope with this shock: this period is known as the "special period". To study the metabolism of the territory during this period, data from the Food and Agriculture Organization of the United Nations, the International Energy Agency, scientific and grey literature were collected. Then, using the data reconciliation tools of the Sustainability transition, environment, economy and local policy (STEEP) research team, analyses of material and energy flows enabled us to take a closer look at the Cuban metabolism before and after the collapse of the USSR. An approach by the economic actors (formal and informal) have made it possible to highlight the question of the organisation mode for the agricultural system, highlighting the role of institutions and their various links in the agricultural system (detailed in a separate submission for this conference : Bouffange et al.). Overall, the island of Cuba saw its oil supply fall by more than 60% between 1989 and 1993, and its fertilizer supply by more than 70%. Differences by economic sector were highlighted, with some sectors particularly affected materially, such as transport. Via a number of social indicators (Gini index, life expectancy, quality of education, access to electricity, etc) the state of satisfaction of human needs was studied. We can see that the quality of energy, education and healthcare services has been only slightly affected by the severe energy constraints. Our interpretation is political choices have been made to prioritize the satisfaction of certain human needs (health, education, food). However, by comparing energy intensity at this period with low-consumption scenarios, we show some limits to how the Cuban case can serve as a basis for thinking about an ecologically sustainable society. It seems to be still very dependent on fossil fuels. This historical case study allows us to imagine what could happen to our economies in the event of an energy contraction, the extent to which our human needs can or cannot continue to be met, and the questions of social organisation that such an event would entail.