

A mathematical model for the recovery of human and economic activities in disaster regions

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In this talk we discuss a design for the recovery process of human and economic activities in a disaster region, getting support from the government and (non-disaster) collaborative regions. We make a recovery model, taking into account an unusual situation of the disaster region. As is easily understood, the (regional) economic growth can be expected when the (invested) capital is suitably provided, the technology is kept on an appropriate level as well as the labor force is constantly supplied for production. Most of serious disasters destroy these economic systems in a moment. Therefore we may need sometimes some drastic reforms of disaster regions for the recovery (cf. [1]).

We attempt to make a mathematical full model for the recovery process in the framework of ordinary differential systems, taking into account the mutual dependence of technological collaboration between the disaster and non-disaster regions as well as recovery of human activity in the disaster region. The economic growth is supposed to be governed by the classical theory due to R. M. Solow [2], and our model consists of nonlinear differential inclusions and equations with some optimization conditions. The objective of this talk is to investigate mathematically the influence of technological collaboration upon the economic growth in both regions as well as to give some theoretical results.

References

- [1] *A. Kadoya, N. Kenmochi*: Revival model of human and economic activities in disaster regions. *Adv. Math. Sci. Appl.* *22* (2012), 349–390.
- [2] *R. M. Solow*: A contribution to the theory of economic growth. *Q. J. Econ.* *70* (1956), 65–94.