Milk and dairy in India's development path: Lessons from a multi-location research

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MILK AND DAIRY IN INDIA'S DEVELOPMENT PATH - LESSONS FROM A MULTI-LOCATION RESEARCH

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Between 2014 and 2019, a team consisting of about ten French researchers worked on Indian dairy farming in the context of two successive IndiaMilk projects. This pluridiscipinary research combined an analysis of national statistical data and fieldwork, carried out in thirteen small study regions in India, located in five states (Gujarat, Andhra Pradesh, Bihar, Karnataka, and West Bengal).

The fieldwork confirmed that it is indeed the poorest rural families that are involved in dairy farming and that livestock farming represents a vital supplementary income for them. But it also shows—and this is a more unexpected result—that livestock farming does not allow them to shift out of poverty in a lasting manner: it, in fact, generates far less income than irrigated crop cultivation and only becomes profitable if livestock farmers have access to land and water to produce fodder easily.

The environmental assessments carried out for the project (nitrogen balance, consumption of fossil energy, greenhouse gas emissions) show that irrigated Indian agriculture that developed with the Green Revolution has a very high environmental impact. This is mainly due to the vast consumption of synthetic fertiliser, particularly nitrogen-based fertilizer, and the energy needed to pump water. The environmental performance of livestock farming per milk-producing female, or per litre of milk, is low due to the consumption of raw material using these large volumes of inputs, combined with low milk yield per cow. The environmental assessment of the dairy herd should, however, take into account its multifunctional nature. Indeed, in certain regions, and for certain farmers, livestock continues to fulfill various functions that have a positive impact on the environment (drought, amendments, nutrients fertilization) and recycle crop residues, particularly straw.

The project confirms that although milk cooperatives, supported by the NDDB, only collect 10% of the milk produced, they nonetheless played a key role in the development of the country's dairy sector and in promoting the inclusive nature of the Indian dairy market. According to this research, producers are not very active in the cooperative decision-making process in terms of orientation, but a range of institutions that intervene at different scales ensure access to the market and the same level of services for everyone, regardless of the quantity of milk delivered. The inclusive aspect of the Indian cooperative model hence seems to function more through the way it structures the market than by developing livestock farmers' capacity to act. Further, the development of Indian cooperatives is concentrated in states in West and South India, and the impact of the Gujarati cooperative Amul is constantly increasing. This spatial heterogeneity reveals a path dependency and questions the ability of the cooperative model to spread. Faced with these internal limitations and external pressure exerted by market liberalization, innovations have emerged. Producers' companies seem to be an organizational and institutional innovation that give rise to new compromises between competition and inclusion.

Finally, the research carried out in the IndiaMilk project allows us to sketch an original interpretation of the role of livestock in India's biophysical economy. The development of irrigated crops that consume high volumes of synthetic inputs led to an increased in land productivity, but the increase in the average agricultural labor productivity has

remained relatively low. Indeed, the active population involved in the agricultural sector remains high in percentage and has even greatly increased since the 1960s in absolute numbers, resulting in a proportionate decrease in farm size. The fieldwork shows that irrigated crop cultivation corresponds to family business farming, where average and large farmers use a workforce of paid-day laborers to take care of the crops. Livestock plays a specific role in this panorama. Indeed, the labor force working on irrigated farms, who have little and sometimes no land, is massively involved in livestock farming, which is a means of supplementing the low income they earn from their crops and as day laborers. The Indian agricultural policy that encouraged the "White Revolution" in parallel to the "Green Revolution" thus seems remarkably coherent: combined with food distribution through the Public Distribution System, it limits the labor cost while ensuring a minimum income for agricultural laborers. In this way, it has probably contributed to decreasing unemployment and the expansion of urban slums, but it nonetheless does not allow a large proportion of the rural population to shift out of poverty.

For further information visit: http://web.supagro.inra.fr/IndiaMilkSeminar/ The IndiaMilk project was funded by INRAE-CIRAD and Agropolis Fondation.