

**Localization of a Sustainable Innovation to  
Alleviate Micronutrient Malnutrition**

**A Stakeholder Analysis to Evaluate Food Fortification in India**

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## **Abstract**

This study focuses on the localization of a sustainable innovation to combat micronutrient deficiencies, specifically vitamin A deficiency, in Rajasthan, India. Food fortification programs evolving from multi-stakeholder processes have proven to be a sustainable solution to reduce deficiency levels in other countries. Hence their potential shall be examined for the Indian context. The research team conducted 26 qualitative interviews in Delhi and Rajasthan to identify roles and perspectives of relevant actors concerned with the topic of hidden hunger. Their interrelations and linkages are displayed in a stakeholder map. Existing cleavages regarding essential characteristic of food fortification programs are revealed. The inductive research approach concludes with a range of hypotheses that represent prerequisites for a localization of a potential fortification program in India.

**Keywords:** Sustainable Innovations, Micronutrient Deficiency, Food Fortification, India

## **6 Conclusion**

Most influential to this study was the paper's underlying assumption that a localization of a sustainable innovation can only be successful following a contextualised adaptation. This led to the research question of how this localization can be achieved in the state of Rajasthan in India. Finally, the study resulted in the development of specific prerequisites of such a localization. The authors revealed stakeholders in India and Rajasthan that are crucial for the implementation of a food fortification program. They gave an overview about the stakeholders' current initiatives, their interrelations and role perceptions. The identification of existing cleavages regarding program characteristics of a potential future food fortification initiative gives further answers to the research question.

Even though this paper does not claim to provide a complete picture about prerequisites for a localization of a food fortification program in India, the discussed hypotheses in chapter 5 show that stakeholders are aware of the problems that a localization would face in the country. They conclude that food fortification has a good potential to decrease micronutrient deficiency levels in India. However, certain problems impede its success. These problems comprise the regulatory framework, scope and scale of a potential program, the distribution channels and the product variety of already existing but also of future multi-stakeholder driven food fortification programs impede its success. This study could not finally clarify, which program characteristics are the most suitable for Rajasthan, respectively for India. On the one hand studies on further Indian states could validate the detected prerequisites and identify further ones. On the other

hand the initiation of a multi-stakeholder process including all identified stakeholders will strengthen the potential of food fortification in India.

Consumers and their perceptions are certainly crucial to design a food fortification program, but were not involved directly in data collection and analysis of this study. Instead this research paper focused on the analysis of key and primary stakeholder groups that would be directly involved in a multi-stakeholder driven food fortification program. Most importantly, the stakeholder map of this study gives a clear picture about who should be involved in a multi-stakeholder process. The key stakeholders (government and international organisations) should lead this process, but consider that primary stakeholders are involved in decision-making and that the needs as well as the interests of secondary stakeholders are adequately addressed. Former experiences of these actors can only then help to bring food fortification forward. Moreover, the stakeholder map shows that the relations between the actors differ largely, ranging from strong alliances to conflicting dependencies. Some stakeholder groups are very good networkers (INGOs/INPOs, NGOs and international organisations). Others are only partially noticed by potential partners (consumer organisations). This network of interrelations will influence the process of stakeholder discussions. That is why the exposure of the prevailing network is very important for a successful localization.

In comparison to other strategies against malnutrition, most stakeholders defined food fortification as a mid-term solution. While supplementation helps to reduce malnutrition in emergency cases, they emphasised that in the long-term nutrition education and dietary diversification have a greater potential to decrease micronutrient deficiency levels. A contextualised food fortification program should therefore include both strategies (whereas supplementation can be used for medically urgent cases) and combine the fortification of staple foods with the creation of awareness about their possible effects but also about healthy nutrition. However, such a program can only reach consumers by including factors that until now impede the Indian population to have a sufficient diet (like gender discrimination and food insecurity). This study could only give a short introduction to these impeding factors (chapter 4). Therefore, research about causes of malnutrition in India that represent the impeding factors of a sufficient diet, needs to be extended. Further, data about micronutrient deficiency levels, the most affected regions and population groups as well as knowledge about consumer demands for fortified foods and their impact on micronutrient levels are often out-dated,

contradictory or even not existing. This hampered not only the research activities of this study but also other research.

Nevertheless, this study reveals: Malnutrition in India cannot only be solved by providing fortified foods, but by following a multi-sectoral approach that helps to solve all causes of malnutrition that includes many stakeholders, their expertise and sphere of influence.