

Non-Timber Forest Products and Childhood Undernutrition

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Background

Human health is inextricably linked to the surrounding ecosystems in which communities reside. These environments provide ecosystem services that are capable of protecting and improving the health of all members of the community, including children. Childhood undernutrition is a global health problem that continues to claim the lives of 3.5 million children annually. To combat childhood undernutrition, solutions that are sustainable and capable of addressing both micronutrient and macronutrient deficiencies are needed. Initiatives that focus on strengthening ecosystem services could be the answer.

OBJECTIVES

Primary Objectives:

- To unite health and environmental development disciplines by presenting childhood undernutrition in a manner that combines the ecosystem services framework with the standard health frameworks for child health
- To develop a novel framework for childhood undernutrition based on non-timber forest products (NTFPs)

Secondary Objectives

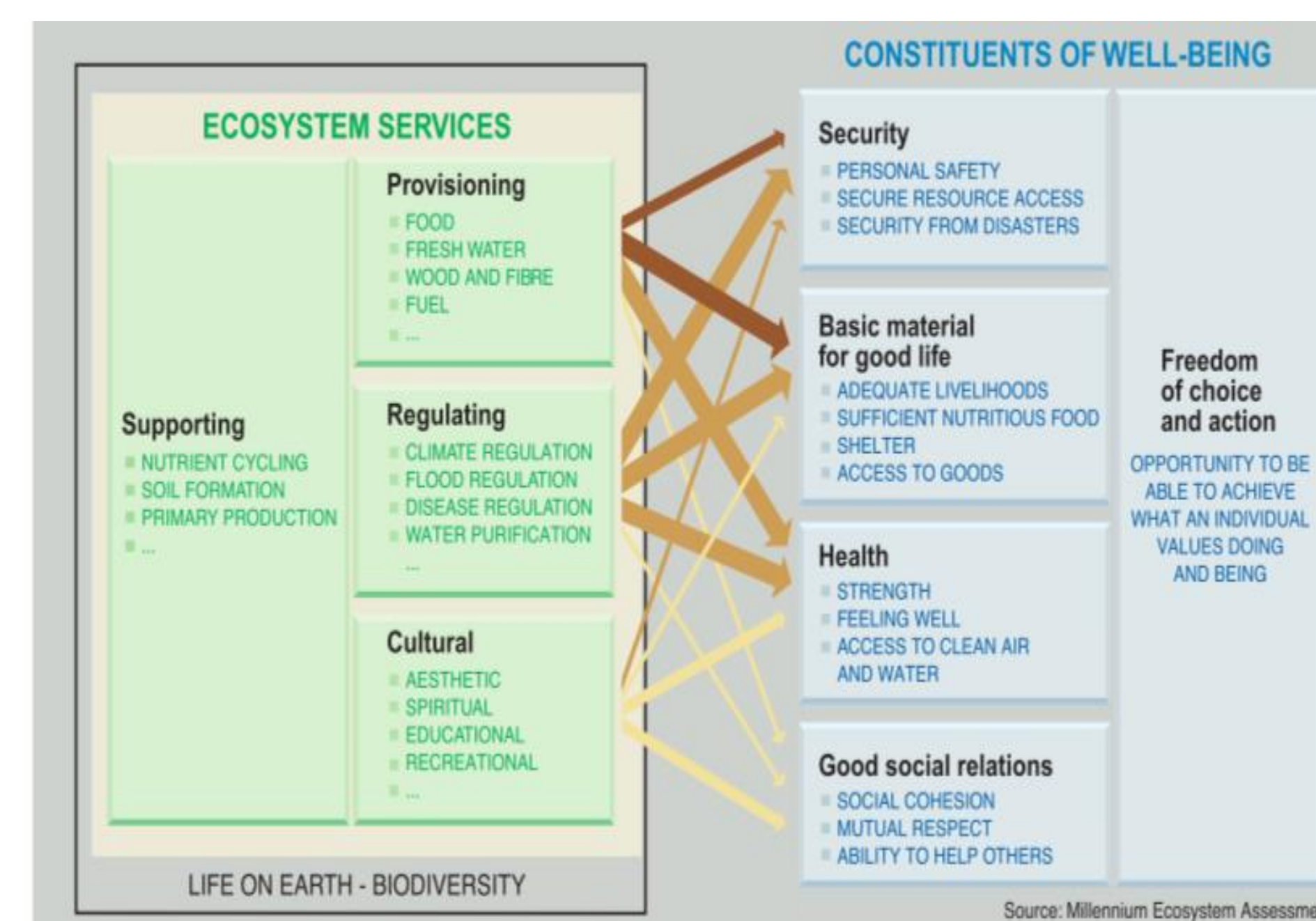
- To briefly overview the current state of global child undernutrition before defining 'ecosystem services' and NTFPs in a way that is helpful to other disciplines
- To explain how non-timber forest products can affect child nutrition
- To assess the appropriate role of NTFPs in fighting child undernutrition, make policy recommendations, and illuminate areas that are in need of further research

MATERIALS AND METHODS

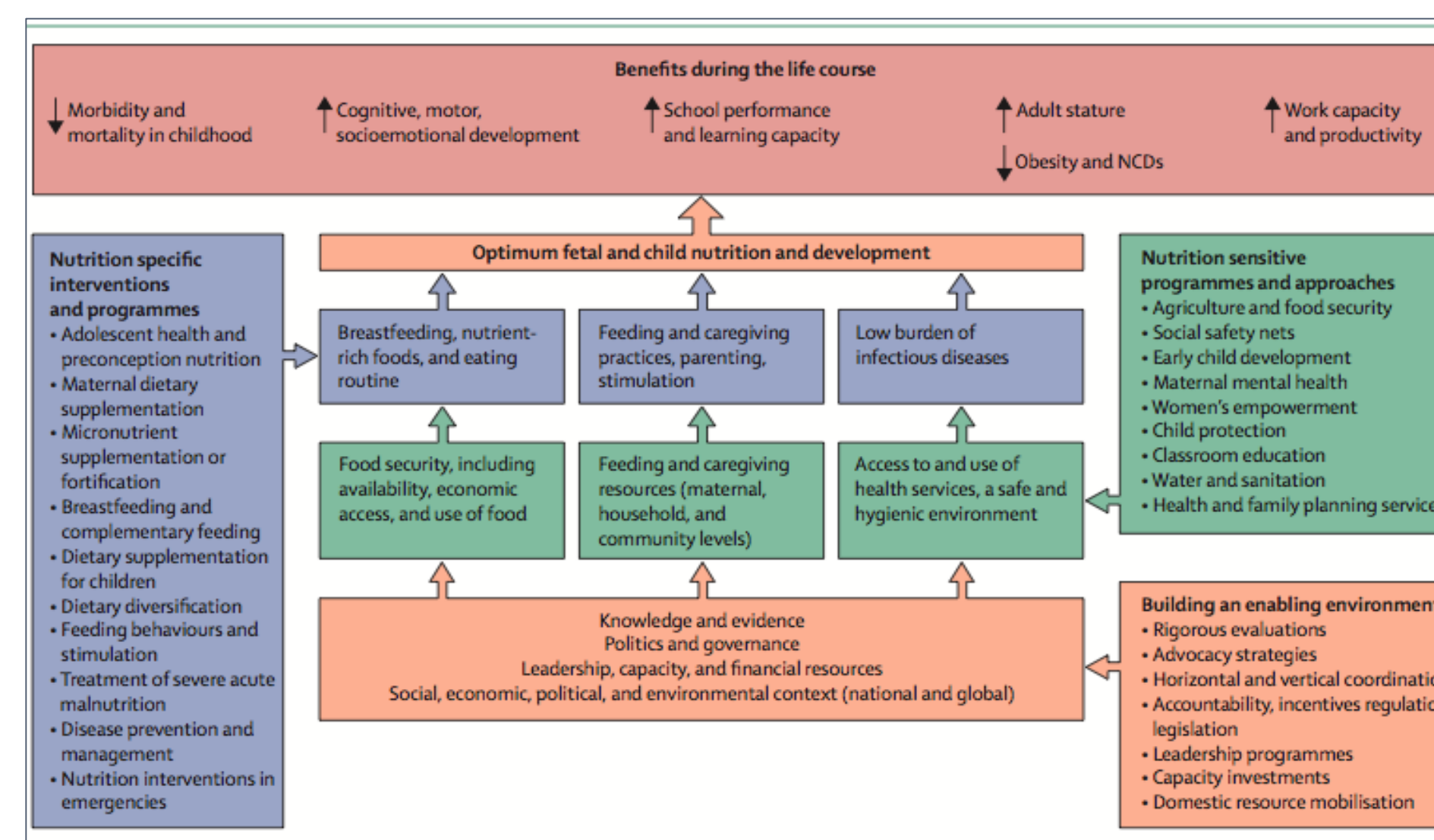
- Structured, non-traditional literature search
- Methods of "snowballing" literature and hand searching were used

STANDARD FRAMEWORKS

ECOSYSTEM SERVICES



FRAMEWORK FOR IMPROVING CHILDHOOD NUTRITION



Sources: BLACK, R. E., VICTORA, C. G., WALKER, S. P., BHUTTA, Z. A., CHRISTIAN, P., DE ONIS, M., EZZATI, M., GRANTHAM-MCGREGOR, S., KATZ, J., MARTORELL, R., UJAUY, R., MATERNAL & CHILD NUTRITION STUDY. G. 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*, 382, 427-51. WHO 2005. Ecosystems and Human Well-Being. *Millennium Ecosystems Assessment*. World Health Organization

FINDINGS

Macronutrition

Protein Sources

- Wild foods like buck, genets, mice, hares, rabbits, porcupines, bush pigs, monkeys, termites, stink bugs, worms, locusts, and mushrooms provide protein and other nutrients [1-3].
- Bushmeat is the primary source of meat and protein for hundreds of millions of people in the developing world[4].
- Rural villagers in Tanzania, South Africa, Nigeria, Madagascar, and the Democratic Republic of Congo consume the majority of their meat and protein from the wild [3, 29-32]
- Wild meat from hunted birds, mammals, and reptiles is found in over 50% of the meals of rural villagers in Indonesia and Sarawak [33, 34]
- Various indigenous groups in Latin America rely on bushmeat for at least 60 grams of protein per day [35]

Carbohydrates:

- In areas of high prevalence, tubers, roots, and bamboo shoots can replace foods such as rice as their staple food and constitute up to 50% of a family's diet [5].

Micronutrition

- Communities with a high percentage of tree cover have significantly more diverse diets and higher intake of vitamin A, zinc, iron, iodine, and vitamin D than communities that have less tree cover [6].
- Fruit and vegetable consumption and diet nutrient density are positively correlated with the tree cover of a community and surrounding areas [6, 7].
- Bushmeat obtained from the forest is also an important source of micronutrients, especially iron, zinc, vitamin A, and vitamin D [6, 8].

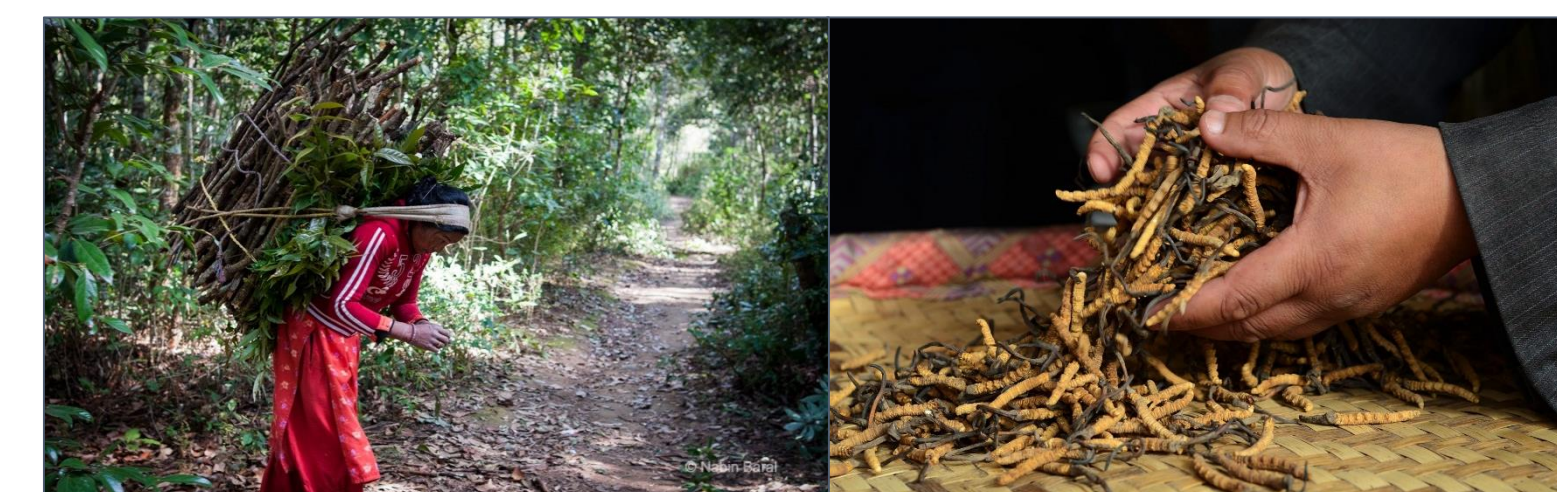


Gap-Filling

- During food shortages between harvest gaps, famines, political turmoil, or ecological disasters forests can "make the difference between good and bad nutrition, between recovered health and prolonged illness, or between food security and starvation" as people resort to the forest in order to gather the foods necessary to survive the time before food becomes secure again [2, 9-11].

Disease Prevention

- Forests provide households with firewood and charcoal to properly prepare both food and water [12].
- Several plants and plant combinations used by traditional healers in parts of Africa have been clinically proven to be effective in preventing and easing the symptoms of diarrhea [13-16].
- Plant products area used in areas such as Cameroon, Nigeria, Brazil, and Bangladesh to prevent and treat malaria [17-20].
- In certain rural areas of Nepal, roots and leaves are used to treat pneumonia and other respiratory diseases [21, 22]



Economic Benefits

- Bolstering economic income is important because it is tied to household food insecurity, inadequate care for the child, unhealthy household environments and us of health services [23].
- Few households that live in proximity to a forest do not use the forest in some way for economic gain [24].
- Food-insecure communities make better use of non-timber forest products for economic gain because the collection and sale of NTFPs has relatively few barriers to entry [24].
- In certain settings, gains made from NTFPs are larger than the gains from timber [25]

Women's Empowerment

- Women are largely responsible for the regular collection and management of forests products such as fuelwood, medicinal plants, wild foods, and grasses [24, 26, 27].
- Women have de facto management rights because men tend to associate themselves with other off-farm activities and agriculture [24, 26, 28].
- Because forests enable women to assert their value to the household and have a role in the management and maintenance of community resources, forest may be area where women may experience empowerment.

SUSTAINABILITY CONSIDERATIONS

Economic Limitations:

- Policy makers must be aware that although focusing on NTFPs may not be the best strategy for bringing people out of poverty, NTFPs remain a significant portion of the small incomes of forest-dependent peoples and enable them to better care for their children

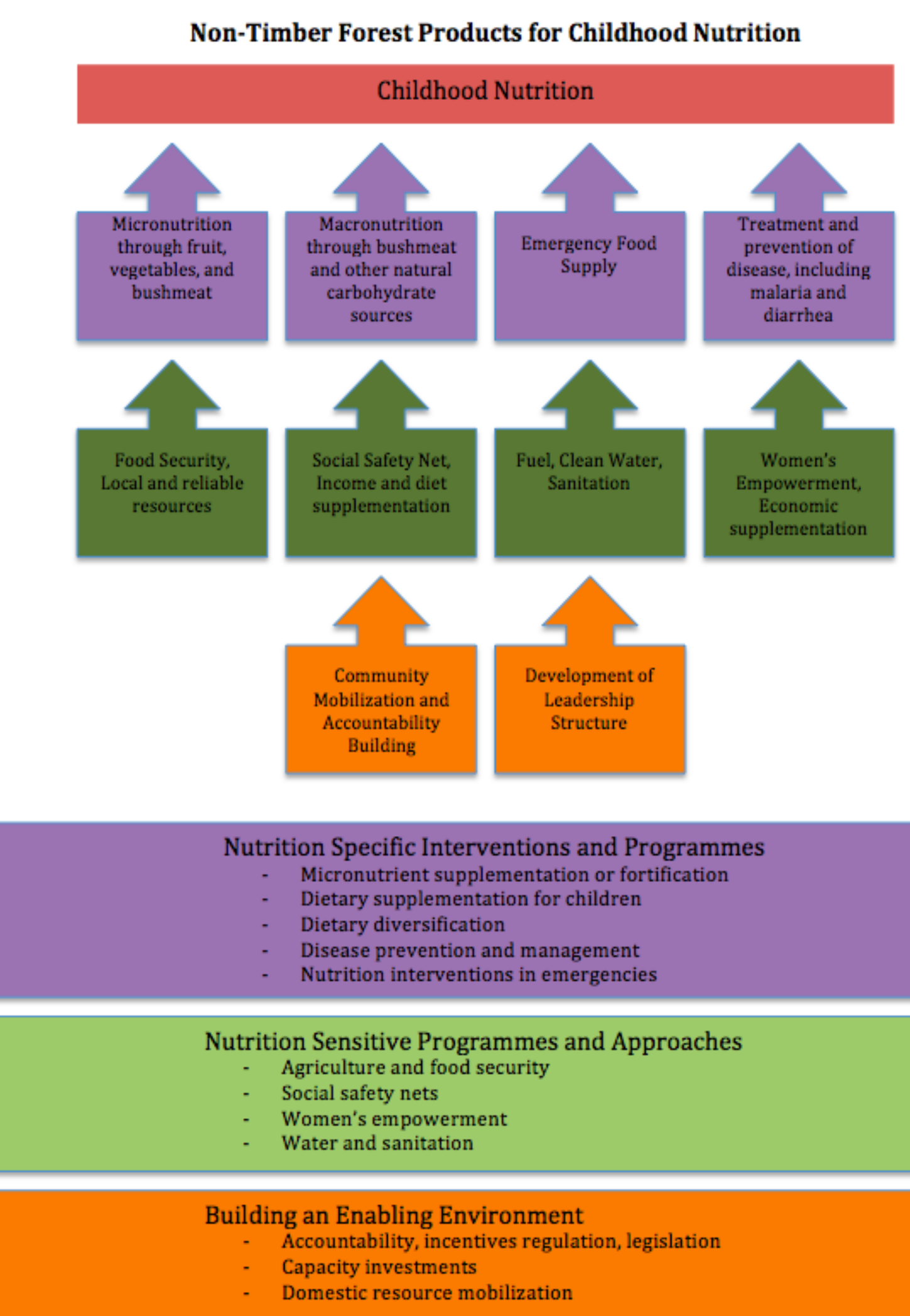
Nutritional Limitations:

- A forest may be capable of only addressing certain aspects of childhood undernutrition, such as the deficiencies of a particular nutrient, and other strategies may be needed to provide other lacking nutrients.

Limitation of Forests

- The ability of forests to provide substantial nutritional benefits to forest-dependent communities may become, or in some regions already is, severely reduced or non-existent due to the limited amount of forest resources per person.
- This is due to a combination of population growth, forest destruction, and the overuse of particular ecosystem services.

NOVEL FRAMEWORK



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