Feasibility Study on Local Production of RUTF in Tajikistan

FINAL REPORT

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The Feasibility Study on the Local Production of Ready-to-use Therapeutic Food in Tajikistan, November 2024, developed by Altai Consulting (Ms. Alizée Boutard and Mr. Nicolas du Payrat), supported by the United States Agency for International Development and in close collaboration with UNICEF's Health and Nutrition section in Tajikistan.

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TABLE OF CONTENT

ACRONYMS

AKDN	Aga Khan Development Network
EBRD	European Bank for Reconstruction and Development
FBF	Fortified Blended Food
DFI	Development Finance Institution
DRS	Districts of Republican Subordination
ICRC	International Committee of the Red Cross
IFC	International Finance Corporation
IMAM	Integrated Management of Acute Malnutrition
ISDB	Islamic Development Bank
LNS	Lipid-based Nutrient Supplements
MAM	Moderate Acute Malnutrition
MT	Metric Ton
MSF	Medecins sans Frontières
MoHSPP	Ministry of Health and Social Protection of the Population
MUAC	Mid-Upper Arm Circumference
RUF	Ready-to-Use Food
RUSF	Ready-to-Use Supplementary Food
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
TB	Tuberculosis
USAID	United States Agency for International Development
WFP	World Food Programme
WHO	World Health Organization

1. EXECUTIVE SUMMARY

This study, conducted by Altai Consulting for UNICEF Tajikistan, evaluates the potential for local production of Ready-to-Use Therapeutic Foods (RUTF) and Ready-to-Use Supplementary Foods (RUSF) in Tajikistan. It assesses the needs for these products in Tajikistan and neighbouring countries, the technical feasibility of local production, financial viability, and provides a roadmap for implementation.

RUTF and RUSF are specially formulated foods designed to treat and prevent malnutrition. RUTF is primarily used for treating severe acute malnutrition (SAM), whereas RUSF is intended to prevent moderate acute malnutrition (MAM). Both products supply essential nutrients necessary for recovery, requiring no cooking or refrigeration.

In Tajikistan, child malnutrition remains a significant health issue, with 5.6% of children wasted, among whom 1.8% are severely wasted. Historically, UNICEF and MSF have been the main suppliers of RUTF, while WFP and the Aga Khan Development Network have supplied RUSF. Consequently, the country depends on international donors, and the availability of RUTF and RUSF fluctuates yearly based on funding rather than actual needs. Currently, there is no local production of RUTF and RUSF in Tajikistan.

International buyers have recently faced increased difficulties to get supplied with RUTF and RUSF. Due to the Ukraine conflict and sanctions on Russia, import costs and delays have surged. Additionally, a 2023 ban on palm oil-based products (used in RUTF) has depleted RUTF stocks, affecting availability for treating SAM. So far, RUSF remains unaffected by the ban.

UNICEF and WFP are planning a transition where the Tajik government would progressively take over responsibility for supplying these products. The country's stable situation and improved living standards have made it less of a priority for donors compared to more volatile regions. To support this transition and cope with the challenges currently faced by importers, UNICEF aims to explore the feasibility of local production in Tajikistan.

Child malnutrition rates are likely to remain high in Tajikistan and neighbouring countries in the coming years. Short-term demand in Tajikistan will continue to rely on international organisation budgets. However these budgets are decreasing, necessitating increased government involvement in the long-term. Export opportunities also exist, particularly to Afghanistan and Pakistan, but acquiring necessary certifications will pose challenges and require time.

Local production is expected to be less expensive than importing due to lower ingredient, labour, and delivery costs. However, it requires a substantial investment estimated at between one and two million dollars depending on production capacity. While Tajikistan produces most necessary ingredients, milk powder and vitamins would need to be imported. Overall, financial viability depends on long-term buyer commitment, especially from the government.

Although several Tajik processors have the technical capacity to produce RUTF and RUSF, none expressed interest in doing so at the time of the study. Food processors are hesitant to depend solely on the government and a few additional customers. Since strict certification is required to sell to UNICEF, WFP, and most international buyers, there will be a delay between investment and revenue, which may also deter companies from entering the market. A streamlined Tajik certification process could mitigate this delay if local certification suffices for government procurement and if the government is willing to allocate funds.

In conclusion, while local production of RUTF/RUSF in Tajikistan is technically feasible and potentially financially viable, its success depends on securing strong government or donor commitment. UNICEF and partners should advocate for a clear government strategy on malnutrition programs. If local production is considered desirable, subsequent steps involve identifying a motivated processor, agreeing on volumes and recipes, and securing funding. Alternatively, lifting the RUTF import ban and sourcing from Pakistani producer Ismail Nutrition could reduce import costs if local production remains unfeasible.

2. INTRODUCTION

2.1. CONTEXT

2.1.1. MALNUTRITION

Malnutrition is a global health issue which threatens the lives of millions of children worldwide. Different forms of malnutrition exist:

- **Stunting**: Child too short for his/her age due to inadequate nutrition during pregnancy and early childhood.
- **Wasting**: Child too thin for his/her height due to insufficient nutrient intake and/or recurring illnesses.
- **Overweight**: Child is too heavy for his/her height due to an excess of caloric intake from foods and beverages in comparison to energy requirements.

Wasting is a primary criterion employed to identify acute malnutrition. In this report, due to a lack of more detailed data, the **prevalence rates of severe and moderate wasting are employed as proxies to estimate the cases of Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM)**.

2.1.2. RUTF & RUSF

Ready-to-Use Therapeutic Food (RUTF) is a specialized Ready-to-Use Food (RUF) used for treating children (6-59m) **suffering from SAM** without medical complications but with appetite[1]. RUTF is formulated and administered to cover the daily energy need during the treatment of SAM, in addition to breast milk in the case of breastfed infants. The dose of RUTF depends on the weight of the child, and the treatment typically lasts from four to eight weeks[2].

UNICEF has typically purchased two types of RUTF products, each with very strict weight and nutritional standards:

- **RUTF Paste**: A paste made from peanuts, vegetable oil, milk powder, sugar, vitamins, and minerals that can be consumed directly from the sachet. Sometimes referred to as Plumpy'Nut (the brand name of the first and largest producer of RUTF paste), it is the most common form of RUTF.

[1] In this report, the number of children with SAM is used to determine the needs for RUTF to simplify the analysis. However, in reality, some children with SAM are not treated with RUTF. Children below six months, as well as those requiring hospital admission are initially excluded from RUTF treatment. Additionally, there are instances where children without SAM receive RUTF treatment. Similar considerations apply to RUSF.

[2] UNICEF – Product Specification Sheets Ready-to-Use Therapeutic Food Paste (S0000240) & Ready-to-Use Therapeutic Food Biscuit (S0000242)

- **RUTF Biscuit**: A biscuit made from pre-cooked cereals, milk powder, vegetable oil, carbohydrates, vitamins, and minerals that can be consumed directly from the sachet or mixed with water or milk to be consumed as a porridge.

Ready-to-Use Supplementary Food (RUSF) shares many similarities with RUTF but is designed to treat children (6-59m) with MAM. RUSF is not designed to serve as the exclusive source ofalimentation; however, it is recommended to include 100g of RUSF per day as part of a comprehensive nutritional diet. The treatment typically lasts slightly longer, ranging from two to three months[3].

The composition of RUSF is quite similar to RUTF. It is generally produced with heat-treated oilseeds, pulses, or cereals, along with sugar, milk powder, vegetable oils, vitamins, and minerals. RUTF and RUSF are usually produced by the same producers since the composition and requirements are very similar.

2.1.3. TAJIK CONTEXT

In Tajikistan, approximately 6% of children (6-59m) are considered wasted and require specific treatment to recover[4]. Until now, UNICEF, WFP, and the Aga Khan Development Network (AKDN) have partnered with the MoHSPP to distribute RUTF and RUSF to Tajik children suffering from SAM and MAM. **As there is no local production of RUTF and RUSF in Tajikistan**, RUTF and RUSF were imported. This overall situation is however evolving:

- UNICEF and WFP - the major suppliers of RUTF and RUSF in the country - are willing to **enter into a transition phase, whereby the Tajik government would take over the supply of RUTF and RUSF for its population**. This situation is triggered by increasing challenges for these organisations to secure funding for such programmes in Tajikistan. The relatively stable situation of the country and claimed improvement in the standards of living makes it, compared to other regions (Afghanistan, Gaza, etc.), less of a priority country for donors.
- **The imports of RUTF have become more challenging and costly lately**. The conflict in Ukraine and the imposition of international sanctions on Russia, through which most of the products exported to Tajikistan from Europe used to transit, resulted in extended delivery times and higher costs (as products now had to transit via Turkey instead, a route which is longer and more costly). RUSF, which are mostly imported from Pakistan, were not impacted.
- **Finally, in 2020 the Tajik government introduced a ban on palm oil-based products which came into effect in 2023.** This ban affected RUTF products as they contain palm oil. For the first semester of 2023, Tajik health facilities were using RUTF stocks imported before the ban implementation. Starting from June 2023, stocks were emptied, and health facilities could not treat children suffering from SAM with RUTF anymore. RUSF products have not been concerned by the ban so far.

[3] UNICEF – Product Specification Sheet Supplementary Spread (S0000248)
[4] Tajikistan – 2017 Demographic and Health Survey

2.2. OBJECTIVES

In this context, UNICEF Tajikistan is willing to **explore alternatives to RUTF imports.** Based on preliminary discussions with the Tajik government, UNICEF is willing to explore the feasibility of producing RUTF products locally. Local production could indeed:

- **Ensure continuous, sustainableand cost-effective supply of RUTF to Tajik children.**
- **Create political interest to reduce overall production costs, making RUTF/RUSF more affordable and reducing the need for foreign currency, and thereby contribute to securing the buy-in of the government to take over such a programme.**

Following discussions with WFP and AKDN and given the similarities in production requirements for RUTF and RUSF, it was agreed to **add RUSF local production to the scope of this research**.

More specifically, this feasibility study on local production of RUTF/RUSF in Tajikistan aims to:

- **Evaluate the needs for RUTF/RUSF** in Tajikistan and neighbouring countries, and the stakeholders' willingness to dedicate budget to purchase RUTF/RUSF.
- **Assess the technical feasibility of local production** including ingredients costs, investment, production challenges, approval/certification processes, food processors' interest, and other challenges deemed relevant.
- **Provide recommendations on the financial viability of locally producing RUTF/RUSF** and determine the most suitable and sustainable business model.
- **Develop a step-by-step roadmap and a business plan** for the selected business model.

2.3. METHODOLOGY

To conduct this assessment, Altai relied on a combination of several sources of information:

- **A comprehensive desk review**, including literature published by international institutions (UNICEF, World Bank, FAO, WHO, WFP, etc.), as well as local sources (MoHSPP, Tajstat, Ministry of Agriculture, etc.).
- **Financial documentation of RUTF/RUSF production facilities in other countries.**
- **20 face-to-face Key Informant Interviews** conducted in Tajikistan during a field trip in December 2023. Stakeholders interviewed included: MoHSPP, Ministry of Industry of Tajikistan, the Republican Paediatrics Centre, Tajik food processors (Obi Zulol, Subhi Vatan, Barakat Isfara, Mersi Baku), international institutions (UNICEF, WFP), donors (USAID) and NGOs (AKDN, MSF).

- **10 remote Key Informant Interviews** with stakeholders not physically present in Tajikistan. Stakeholders interviewed included: other UNICEF offices (Pakistan, Afghanistan, Vietnam), IRD, WHO, a RUTF producer in Africa, ICRC (International Committee of the Red Cross) Afghanistan.
- **Five visits to potential production sites** located in Dushanbe and the Sughd region.

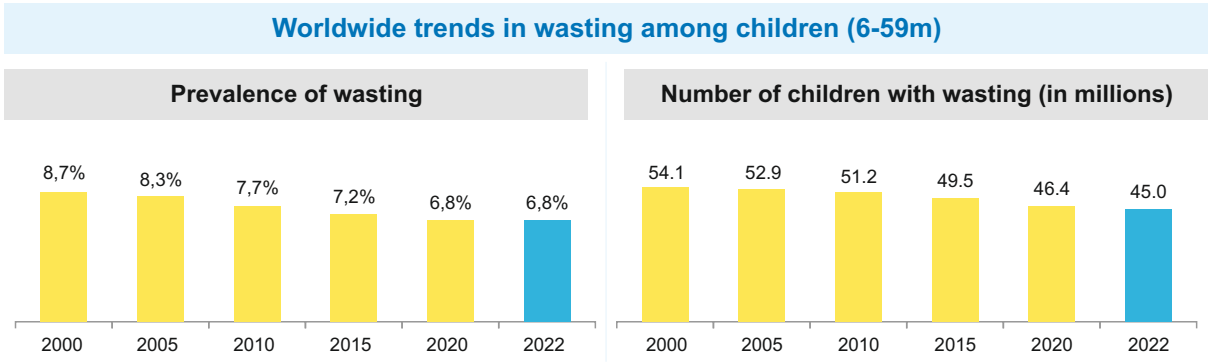
The results of this feasibility study are provided in **two complementary documents**:

- **This report**, which presents key information related to the global context, the Tajik context, the local and regional demand for RUTF/RUSF, the technical capacity of producing RUTF/RUSF in Tajikistan, the presentation of a few business models/scenarios to evaluate the financial viability of the project and recommendations for UNICEF and its partners.
- **An Excel model,** which includes all the costed assumptions that were made to evaluate the financial viability of local RUTF/RUSF production. This model has been built as a "tool" that can be used by UNICEF and its partners to enter different hypotheses of local RUTF/RUSF production and see whether they would lead to a financially viable option or not. Hypothesis that UNICEF and its partners can "play with" with the tool include: whether the project will be greenfield or brownfield, the estimated burden of SAM and MAM in Tajikistan, the proportion of the SAM/MAM cases treated with RUTF/RUSF in Tajikistan, the recipe used, the number of SAM/MAM cases treated in neighbouring countries, the price per carton (150x sachets), the average number of RUTF/RUSF per child treated, etc.

3. GLOBAL SUPPLY AND DEMAND TRENDS FOR RUTF AND RUSF

3.1. NEEDS

The worldwide prevalence of wasting among children (6-59m) has progressively decreased over the past twenty years. In 2022, an estimated 45 million children (6-59m) were affected by wasting (6.8%), down from 54.1 million (8.7%) in 2000[5]:

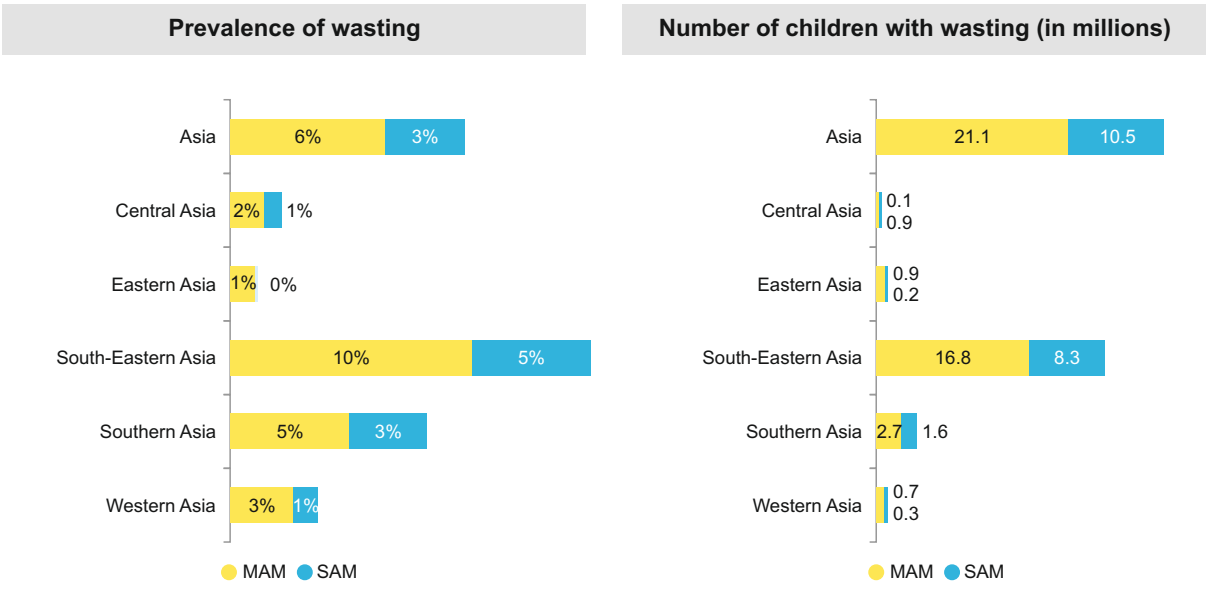


The decline in the number of children with wasting, despite the stagnation of wasting prevalence, is attributed to a global decrease in the population of children under five years old[6]. In 2022, 13.6 million (2.1%) children experienced severe wasting.

Wasting is predominantly concentrated in Asia and Africa, with Asia hosting more than three-quarters of all children with severe wasting, while an additional 22% reside in Africa. In Asia, the prevalence of wasting varies significantly across sub-regions[7]:

[5] UNICEF/WHO/WB – Levels and trends in child malnutrition – 2023
[6] United Nations - World Population Prospects (2022)
[7] UNICEF/WHO/WB – Levels and trends in child malnutrition (2023)

Wasting among children (6-59m) in Asia



Southern-eastern Asia has the highest prevalence of MAM and SAM in Asia, accounting for 80% of the children with wasting on the continent. Central Asia, in contrast, has a relatively low prevalence of wasting, close to 3%, compared to other Asian sub-regions.

However, **there are significant concerns that the reduction in the prevalence of MAM and SAM** at the global level **may be hindered**, given the ongoing conflict in Ukraine impacting food supplies, the challenging situations in Gaza and Afghanistan notably, and the growing inflation worldwide.

3.2. DEMAND

3.2.1. KEY PROVIDERS

UNICEF, USAID and Médecins Sans Frontières (MSF) are the largest providers of RUTF globally. UNICEF procures 75-80% of the global demand for RUTF. USAID has been providing RUTF in kind to UNICEF since 2012, accounting for an additional 5 to 10% of the global procurement[8].

The World Food Programme (WFP) is the main provider of other Lipid-based Nutrient Supplements (LNS) products, which principally include RUSF and medium-quantity LNS with lower volumes of small-quantity LNS. Similarly, USAID donates 5-10% of global volumes in kind to WFP[9].

Governments, along with various UN agencies including the UN High Commissioner for Refugees (UNHCR) and the World Health Organization (WHO), as well as

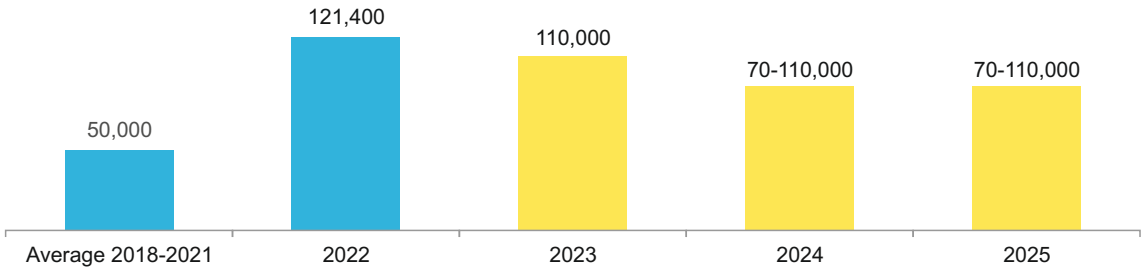
[8] UNICEF Supply Division – RUTF: Market and Supply (May 2023)
[9] UNICEF Supply Division – RUTF: Market and Supply (May 2023)

organisations like Action Against Hunger (AAH) and ICRC, directly procure the remaining RUTF and RUSF.

3.2.2. VOLUMES

The treatment of SAM has garnered substantially **more funding in 2022 and 2023** compared to previous years. As a result, UNICEF's RUTF procurement has more than doubled, reaching **121,400MT in 2022** compared to an average of **50,000MT between 2018 and 2021**[10].

Volume of UNICEF RUTF Procurement (in MT)



UNICEF Supply Division anticipates the volume of procured RUTF to reach 110,000 in 2023 and to remain between 70,000MT and 110,000MT in 2024 and 2025.

In 2022, the cumulative volume of procured RUTF and other LNS products reached an estimated amount of 308,000MT[11].

3.2.3. CHALLENGES INCURRED

Due to a market structure concentrated around a few international clients (UNICEF, WFP, MSF, etc.), producers face the following challenges:

- **The whole market heavily depends on UNICEF and WFP budgets and priorities** which may fluctuate depending on the international context.
- **UNICEF and WFP purchase orders tend to be issued at similar times** all over the world, which can create global shortages.
- **Producers tend to be dependent on a very small number of clients**, particularly in countries where only a limited number of stakeholders have programmes addressing child malnutrition.

[10] UNICEF Supply Division – RUTF: Market and Supply (May 2023)
[11] UNICEF Supply Division – RUTF: Market and Supply (May 2023)

- **Producers lack visibility beyond one year due to the timeframe of budgets.** Additionally, all orders are processed almost simultaneously, leading to limited order linearity throughout the year.

3.3. SUPPLY

Between 2000 and 2007, UNICEF exclusively sourced supplies from Nutriset. In response to increasing demand, Nutriset gradually began establishing franchisees across Africa, the Americas, and Asia under the PlumpyField network.

To diversify its suppliers and localise production in the countries of consumption, UNICEF progressively encouraged the development of new suppliers. In 2022, among the 21 producers registered with UNICEF supply, 18 were based in countries with a high burden of severe wasting. As a result, between 2019 and 2023, UNICEF obtained supplies from the following producers[12]:

- Europe: Nutriset (France).
- North America: Edesia, Mana (USA), MFK (Haiti).
- Africa: NutriGuinée (Guinea), Burkina Faso (InnoFaso), Nigeria (Ariel, NutriK, DABS), South Africa (GC Reiber Compact SA, Luvia), Madagascar (Société JB), Malawi (PPB), Kenya (Insta), Ethiopia (Hllina), Sudan (Samil).
- Asia: Ismail Nutrition (Pakistan), Compact India, Hexagon, Nuflower, NutriVita, Soma (India).

There are multiple categories of RUTF producers which tend to produce also RUSF. A few companies specialize in LNS processing (e.g., Hilina Enriched Foods, InnoFaso, INSTA Products), while others are general food processors (e.g., Ismail Nutrition, Société JB) and NGOs (e.g., MFK, PPB). Despite increased diversification, many producers are still either subsidiaries of Nutriset (e.g., NutriGuinée, NutriK) or members of the PlumpyField network (managed by Nutriset).

While suppliers historically operated at less than 50% of their total installed capacity, the recent surge in RUTF demand has prompted a paradigm shift, creating potential for additional capacity[13]. Considering the significant transportation costs, it is also essential to analyse capacity regionally.

3.4. ALTERNATIVE RECIPES

Outside of the recipes certified by UNICEF and WFP, alternative formulations are being developed to meet the following objectives:

- **Proposing recipes more adapted to local tastes**, especially in countries where peanuts are not a staple food in the local diet, and peanut paste has a low acceptability rate.

[12] UNICEF Supply Division – RUTF: Market and Supply (May 2023)
[13] UNICEF Supply Division – RUTF: Market and Supply (May 2023)

- **Reducing costs** by using ingredients that are cheaper and easily available in the countries of production.

Since milk and peanuts are the most expensive ingredients in standard RUTF products, most alternative formulations aim at replacing them. These recipes can be grouped into three categories:

- **Renovation**: peanuts are fully or partially replaced by a combination of alternative cereals, legumes or grains, in addition to 50% protein sourced from dairy.
- **Innovative**: dairy proteins are fully or partially replaced by a combination of cereals, legumes, grains or animal proteins (e.g. fish, egg or insect proteins).
- **Novel**: combination of cereals, legumes or grains and added amino acids and/or different amounts of vitamins and minerals.

Alternative formulations effectively achieve a price reduction ranging from 4% to 6%[14]. Despite supporting the development of new recipes in several countries, as of December 2023, UNICEF had only purchased two types of RUTF: peanut paste and biscuits. However, UNICEF released the product specification sheet for a RUTF product based on chickpeas and soya beans in 2023, which may open up new recipe possibilities for producers.

[14] UNICEF – Alternative Recipes for RUTF

4. UNDERSTANDING THE TAJIK CONTEXT

4.1. MALNUTRITION IN TAJIKISTAN

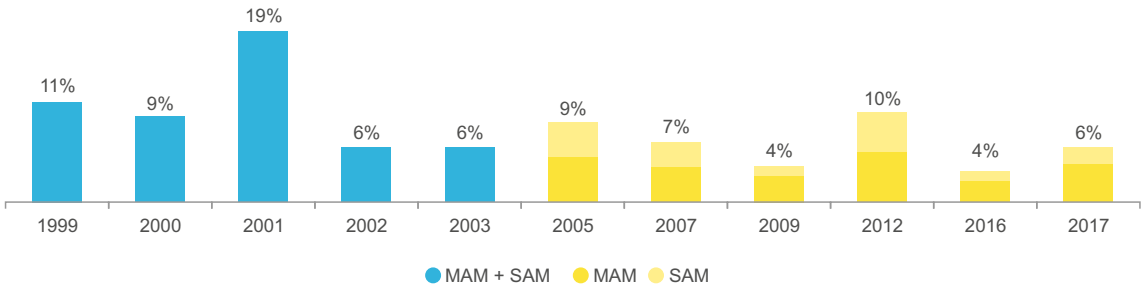
4.1.1. EVOLUTION OF MALNUTRITION

According to the two most recent national health and nutrition surveys, **child malnutrition remains a health issue in Tajikistan**:

- **2017 - Demographic and Health survey:** 18% of children (6-59m) are stunted, 5.6% are wasted (among which 1.8% are severely wasted), 3% are overweight.
- **2016 - National Nutrition Survey in Tajikistan:** 20.9% of children (6-59m) are stunted, 2.8% are wasted (among which 1.1% are severely wasted), and 4.1% are overweight.

While stunting has steadily decreased over the last two decades and reached 18% from 42% in 1999[15], **the prevalence of wasting has remained stable overall since 2002**, with some variations, possibly due to differences in survey methodology[16]:

Wasting prevalence among children (6-59m) in Tajikistan - UNICEF Child Malnutrition Database



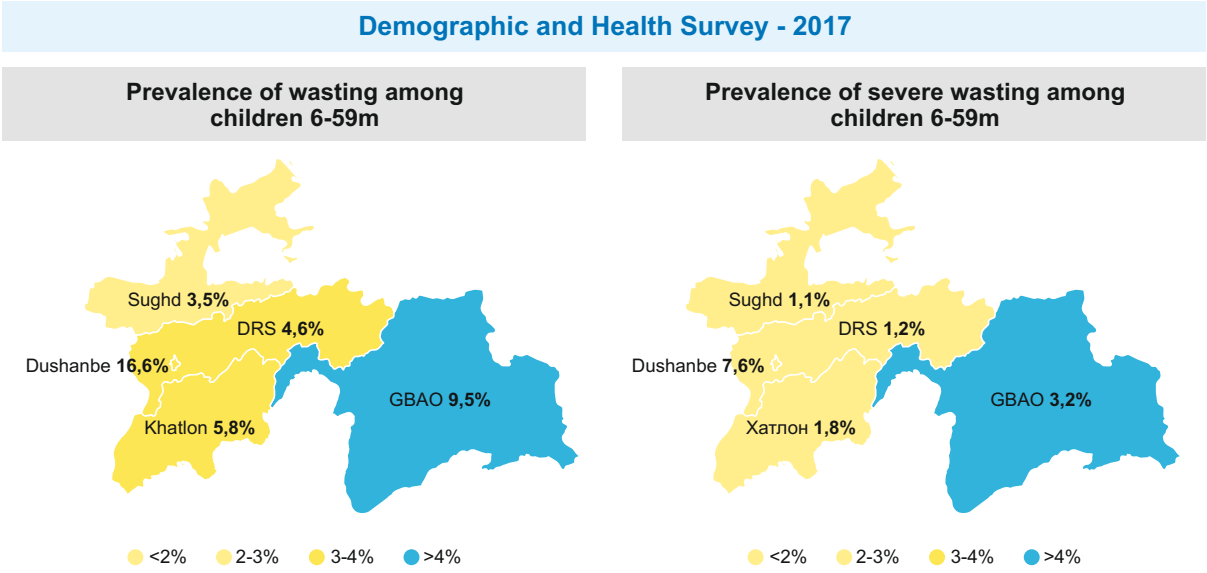
The latest national surveys may be outdated as they were conducted before the onset of Covid-19 and the conflict in Ukraine[17]. With the highest proportion of GDP derived from remittances in the world, standing at a whopping 50.9%[18], Tajikistan is very dependent on the Russian economy, where most of its emigrants seek work. The sanctions against Russia are likely to have impacted many Tajik families' income. Due to the scarcity of domestic job opportunities, emigration continues to be high.

[15] UNICEF/WHO/World Bank Joint Child Malnutrition Estimates Database - May 2023
[16] UNICEF/WHO/World Bank Joint Child Malnutrition Estimates Database - May 2023
[17] The results of Demographic Health Survey 2023 will be published in 2024.
[18] World Bank, Personal remittances, received (% of GDP) - 2022

The availability of RUTF treatment has decreased recently due to a ban on the import of products containing palm oil, which is used in RUTF. As a result, many children are not receiving adequate treatment, which could potentially lead to increased morbidity and mortality from SAM.

4.1.2. REGIONAL DIFFERENCES

The severity of the situation regarding malnutrition varies across regions. Dushanbe and GBAO are significantly more affected than other regions, with a considerably higher proportion of wasting and severe wasting among children, approximately twice as high as in other regions[19]:



The high prevalence of children with SAM and MAM in Dushanbe may result from children residing outside the region but visiting health facilities in the capital.

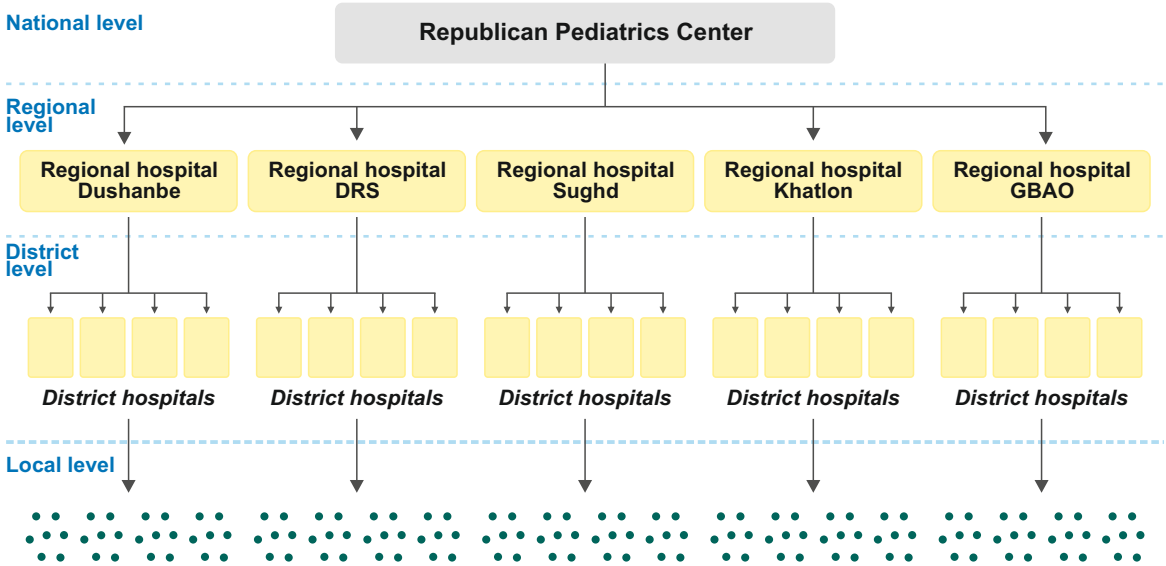
4.2. MANAGEMENT OF MALNUTRITION

In August 2020, the MoHSPP of the Republic of Tajikistan approved the revised guidelines *"Integrated Management of Acute Malnutrition"* (IMAM)**.** These guidelines were drafted by the MoHSPP with technical and financial assistance from WHO and UNICEF. They provide a framework for identifying and treating SAM and MAM cases in the country. The guidelines are being taught to doctors and health workers throughout the country, and the key principles are as follows:

[19] National Nutrition Survey in Tajikistan - 2016

- **All health workers and doctors should actively identify SAM and MAM cases** through the assessment of MUAC, weight-for-height z-score, and clinical signs of oedema.
- **If there is suspicion of SAM and the initial examination is conducted by a non-doctor health worker, the child should be referred to a qualified doctor**, typically by visiting a higher-level health facility where doctors are available for consultation. Only doctors can confirm a SAM diagnosis and make further referrals for:
    - Inpatient programme if the child suffers from medical complications or has no appetite.
    - Outpatient programme if the child is not suffering from additional medical complications and has an appetite
- **Inpatient programme patients are generally treated in hospitals**. They undergo three different phases (stabilization, transition, and rehabilitation) and receive specific therapeutic milk/food at each phase. When their condition improves, they can be referred to an outpatient programme (where they will continue to receive SAM treatment in the form of RUTF) if available, or to a supplementary feeding programme (where they will receive MAM treatment in the form of RUSF or other food). Some children may leave the inpatient programme voluntarily (default) or experience treatment failure (no improvement in their situation after 4 months), while others may unfortunately die.
- **Outpatient programme patients are treated at home with RUTF and RUSF**, under the supervision of a local health centre linked to a hospital with an inpatient programme. The child and the caregiver visit their local health centre weekly to receive their RUTF/RUSF portions and undergo examinations to monitor the evolution of wasting. Depending on the child's progress, doctors may decide to refer the child to the inpatient programme (if their health is deteriorating), adjust their RUTF intake, refer the child to a supplementary feeding programme, or discharge the child as per the IMAM protocol.
- **The distribution of RUTF** (along with other paediatric medicines and medical supplies) **in Tajikistan is coordinated by the Republican Paediatrics Centre in Dushanbe**. This centre receives all RUTF imported into the country by UNICEF on behalf of the MoHSPP. Healthcare facilities and hospitals at all levels assess their RUTF (and other paediatric medicines and medical supplies) requirements and communicate them to the higher level. For example, local health centres with outpatient programmes share their RUTF needs with district hospitals, which, in turn, share these needs with regional hospitals. Regional hospitals then travel to Dushanbe to collect RUTF (and other paediatric medicines and medical supplies) before distributing them to district hospitals, which further distribute them to local health facilities.
- **Regarding the delivery and distribution of RUSF, it is handled by the Primary Health Centers** (PHCs) **in the targeted districts and imported by WFP**. WFP also provides technical support in the management and handling of RUSF.

Malnutrition management and RUTF distribution structure in Tajikistan



District PHC facilities, rural health centres, "health houses", etc. - with or without doctors

Not all regions and districts in Tajikistan benefit from outpatient programmes and, consequently, RUTF supplies. Over the past few years, only Dushanbe and all the districts in Khatlon have benefited from these programmes, primarily due to funding limitations that prevented UNICEF from extending coverage to more districts or regions. In districts where RUTF is not available, children can be treated at local health facilities with F-100 for a few days, followed by the provision of locally prepared highly caloric diet food.

Similarly, the treatment approach for children suffering from MAM varies depending on the district they reside in. Four districts in Khatlon and one district in Sugdh have a supplementary feeding programme where children can benefit from FBF/RUSF (Super Cereal + or Acha Mum) provided by the World Food Programme (WFP). AKDN also provides RUSF to health facilities in a few localities. In other districts, doctors and health workers offer advice to caregivers of children with MAM, helping them improve micronutrient intake through education on good nutrition habits and providing examples of nutritious recipes for home use.

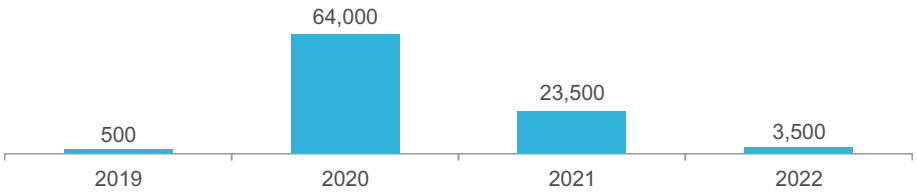
4.3. RUTF & RUSF SUPPLY

4.3.1. SUPPLIERS

UNICEF and MSF are the exclusive suppliers of RUTF in Tajikistan, **while WFP and AKDN are the exclusive suppliers of RUSF**. **UNICEF is the main provider of RUTF to children with SAM** in Tajikistan. Over the last four years, the volume of

RUTF that the institution ordered has fluctuated significantly based on the budget available for treating SAM[20]:

Volume of RUTF purchased by UNICEF in Tajikistan (in kg)



Between 2,700 and 12,900 children are treated with RUTF provided by UNICEF each year[21]. The institution has progressively increased the number of health facilities distributing its RUTF, from 68 in 2018 to 135 in 2022. The UNICEF Supply Division in Copenhagen oversees the supply of RUTF (financial aspects, delivery, etc.).

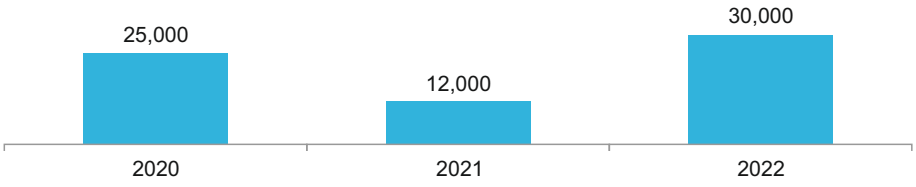
Médecins Sans Frontières (MSF) provides treatment for tuberculosis (TB) in the Dushanbe region and supplies RUTF to children and adults weakened by TB. The total volume purchased remains relatively small, accounting for approximately 137 kg in 2023, supplied by the MSF Supply Division in Amsterdam.

MSF is currently closing its office in the country, as it is not considered a priority intervention country by the organisation anymore. It is gradually downsizing its programmes to conclude them by 2025. An agreement has been reached with the Tajik government to assume control of the fight against TB.

WFP is the main provider of RUSF to children with MAM in Tajikistan. The organisation assists 264 primary healthcare centres in five target districts: Four districts in Khatlon Region (Jaloddini Bakhi, Dustri, Kulob, Shahritus) and one district in Sughd Region (Ayni District).

WFP supports the treatment of approximately 6,000-7,000 children with MAM per year, and purchase between 12MT to 30MT of RUSF annually[22]:

Volume of RUSF purchased by WFP in Tajikistan (in kg)

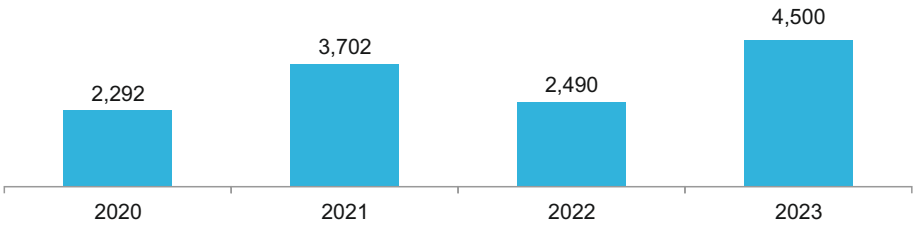


[20] UNICEF
[21] UNICEF – NutriDash. These figures include children who have been cured, children who have defaulted, children who have died, and children who have not responded, excluding those who have been medically transferred.
[22] WFP Tajikistan

AKDN supplies RUSF to children with MAM in some districts of Khatlon and GBAO in partnership with the MoHSPP. There is no coordination with WFP regarding the districts to target, but they do not support the same health facilities.

AKDN supports the treatment of between 400 and 700 children with MAM per year, depending on the number of cases identified in the supported hospitals[23]:

Volume of RUSF purchased by AKDN in Tajikistan (in kg)



4.3.2. PRODUCTS

Two types of RUTF are available in Tajikistan:

BP-100

- **Producer:** GC Rieber Compact
- **Production site:** Norway
- **Suppliers:** UNICEF, MSF
- **Composition:** Cereals, milk powder, vegetable oil and carbohydrates, vitamins, minerals
- **Shelf life:** Four years

Plumpy'Nut

- **Producers:** Nutriset/PlumpyField [roducers
- **Production site:** France/Independent producers' factories in Africa, India, USA and Haiti
- **Supplier:** MSF
- **Composition:** Peanut paste, vegetable oil, powdered milk, powdered sugar, vitamins, minerals
- **Shelf life:** Two years

Most of the RUTF distributed in Tajikistan is in the form of BP-100, despite being relatively uncommon internationally. Some respondents have mentioned that BP-100 is better accepted than Plumpy'Nut, and the decision also considered concerns about peanut allergies. The existence of any acceptability study could not be confirmed.

[23] AKDN

While Acha Mum is the only RUSF available in Tajikistan, Super Cereal + is a fortified blended food (FBF) that can be used as an alternative to treat children with MAM.

Acha Mum (RUSF)	Super Cereal+ (FBF)
	
• **Producer:** Ismail Nutrition • **Production site:** Pakistan • **Suppliers:** WFP, AKDN • **Composition:** Chickpeas, vegetable oil, milk powder, sugar, vitamins, minerals • **Shelf life:** Two years	• **Producer:** n.a. • **Production site:** Europe • **Suppliers:** AKDN (for pregnant & lactating women), WFP (not anymore) • **Composition:** Corn/wheat/rice soya, milk powder, sugar, oil, vitamins, minerals • **Shelf life:** 18 months

WFP used to supply children with Super Cereal+ but switched to providing Acha Mum in 2022. The shift happened because of two main reasons:

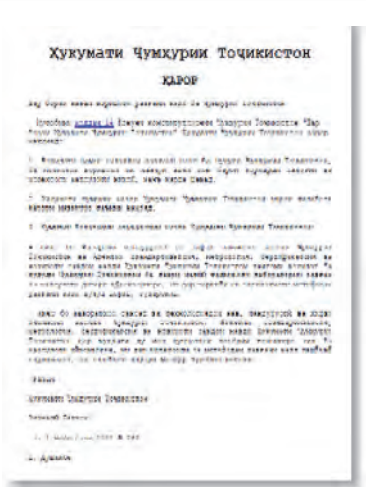
- Obtaining Super Cereal+ had become increasingly challenging because of a global shortage.
- Super Cereal+ requires access to either clean water or milk, which may pose difficulties in some remote areas, whereas Acha Mum is ready to use.

AKDN distributes Acha Mum to children with MAM and Super Cereal + to pregnant and lactating women.

4.3.3. PALM OIL BAN

In 2020, the Tajik government issued Decree n°260 prohibiting the import of palm oil into Tajikistan, except for palm oil intended as raw material for industrial processing and the production of finished products. The ban came into effect in 2023.

As RUTF contains palm oil, imports have been prohibited since then. In 2023, MSF had to dispose of a shipment after it was blocked at customs. At the time of the fieldwork in December 2023, no RUTF was available in the different health facilities in the country. All had transitioned to a treatment model similar to districts without outpatient programmes, i.e. providing caregivers with recipes to prepare highly caloric diet food from local ingredients. As health facilities began to run out of stock for RUTF starting in June 2023, the impact of the absence of RUTF on SAM in the country was too recent to be measured.



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However, all the doctors interviewed mentioned the high efficiency of SAM treatment with RUTF and its significant contribution to decreasing SAM in the country in the past years. They expressed a willingness to reintroduce RUTF, and the MoHSPP is currently collaborating with other Tajik administrations to seek an exemption from the new palm oil ban law for RUTF. Representatives from the MoHSPP, whom Altai met during the fieldwork, were confident that this exemption should be achieved in the coming months.

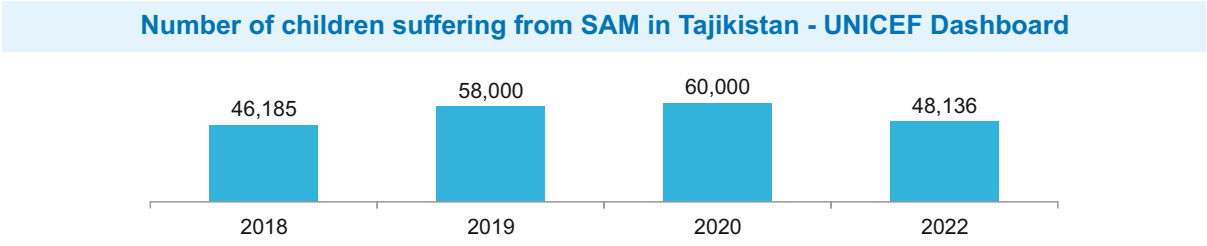
5. RUTF & RUSF DEMAND IN TAJIKISTAN (AND IN THE REGION)

5.1. NEEDS

5.1.1. NEEDS IN TAJIKISTAN

Data on children suffering from acute malnutrition in Tajikistan are scarce, and estimations depend on the sources, and methodologies used.

UNICEF estimates that approximately 50,000 children suffer from SAM in Tajikistan[24]:



Two studies conducted in 2016 and 2017 include estimates of the prevalence of MAM and SAM in Tajikistan. Based on population estimates from January 2021, the number of children between 6 months and 59 months is approximately 1,028,000.

A typical estimate for the average duration of an untreated episode of MAM/SAM is 7.5 months[25]. Utilizing this figure to approximate the incidence over a year (12 months) results in the following equation: *Incidence = Prevalence × 12/7.5 = Prevalence × 1.6*. Hence, 1.6 serves as the correction factor for incidence calculations based on a given prevalence.

The MAM/SAM burden is determined by estimating the cumulative number of MAM/SAM cases within a population during a year, encompassing both prevalent and incident cases. This estimation is derived by calculating the MAM/SAM prevalence and adjusting for incidence using the correction factor. This calculation can be expressed as follows: *Burden = Prevalent cases + Incident cases = Population x (Prevalence + Prevalence x 1.6) = Population x Prevalence x 2.6*

Assuming a similar prevalence, we can estimate the following burden:

[24] UNICEF – Nutridash
[25] Garenne et al. – 2009

		Moderate Acute Malnutrition		Severe Acute Malnutrition	
Year	Source	Prevalence	Estimated burden (based on 2021 pop.)	Prevalence	Estimated burden (based on 2021 pop.)
2017	Demographic National Survey	3.8%	101,600	1.8%	48,100
2016	National Nutrition Survey in Tajikistan	1.7%	45,400	1.1%	29,400

The MoHSPP reported that the number of children suffering from SAM and MAM has steadily decreased over the last few years, but this information, mostly based on perception, could not be verified with hard data.

To build a financial viability model for RUTF and RUSF production in Tajikistan, this report relies on the following hypothesis for SAM and MAM annual burden in the country:

- **48,100 SAM cases** per year
- **101,600 MAM cases** per year

The study's assessment of the needs in Tajikistan is constrained by the lack of data more recent than 2017, as the situation may have evolved over the past five years.

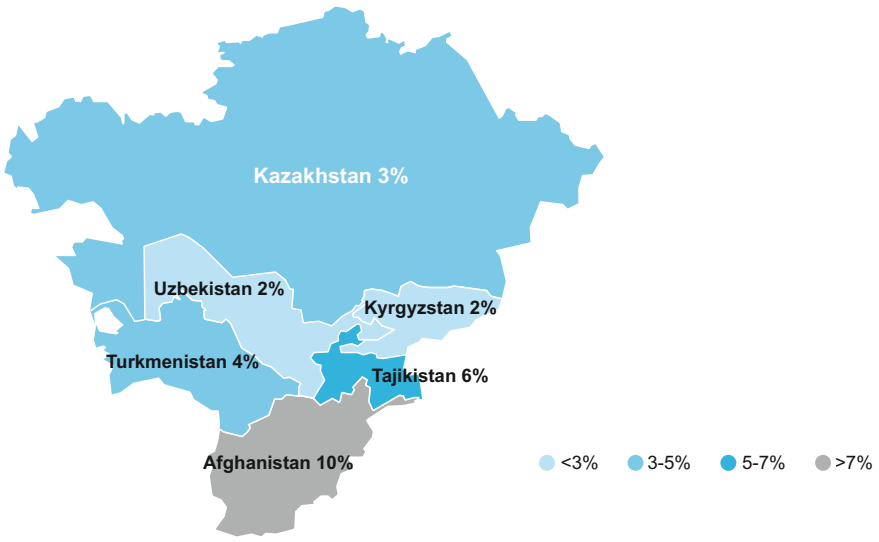
5.1.2. NEEDS IN NEIGHBOURING COUNTRIES

Very few comparable data are available to estimate the burden of SAM and MAM in Central Asian countries and Afghanistan. To compare the situation of the different countries, Altai is using available data on wasting (which can be used as a proxy of the burden of SAM and MAM combined), with an objective to identify countries where the need for RUTF/RUSF is the highest.

Central Asian countries[26] have a relatively low prevalence of wasting among children under five years old ranging from 2% to 6%[27]:

[26] UNICEF Geoscheme excludes Afghanistan
[27] UNICEF/WHO/WB – Levels and trends in child malnutrition – 2023; UNICEF – Afghanistan's silent emergency

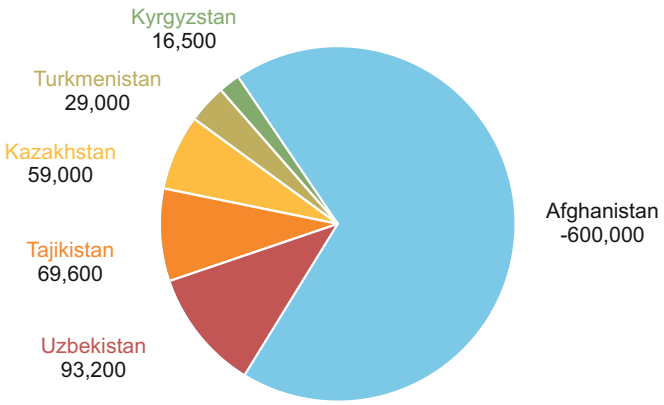
Prevalence of wasting



Tajikistan has the highest prevalence of wasting among ex-USSR countries, followed by Turkmenistan (4.1%) and Kazakhstan (3.1%). With the return of the Taliban to power in Afghanistan, the proportion of children suffering from wasting has almost doubled, increasing from 5.1% in 2018[28] to 9.5% in 2023[29], leading to a significant humanitarian crisis.

Approximately 850,000 children are afflicted with wasting in Central Asia and Afghanistan[30]:

of children suffering from wasting



[28] UNICEF/WHO/WB – Levels and trends in child malnutrition – 2023
[29] UNICEF – Afghanistan's silent emergency
[30] UNICEF/WHO/WB – Levels and trends in child malnutrition – 2023; Calculation based on UNICEF – Afghanistan's silent emergency

Afghanistan represents approximately 70% of children suffering from wasting in the region, with Tajikistan at 10% and Uzbekistan at 8% among Central Asian countries. In the broader region, Pakistan has 2.1 children with wasting, and Iran has 330,000, contributing significantly to the overall burden of children experiencing wasting.

5.2. DEMAND

5.2.1. FROM NEEDS TO DEMAND

The burden of SAM/MAM is not the sole factor to consider when estimating the demand for RUTF/RUSF. First, identifying the children with SAM/MAM is a key challenge:

- **Parents are often unaware that their children are suffering from acute malnutrition** until they experience significant medical complications, with many attributing their children's condition to mere small stature.
- **Identification of children with MAM/SAM usually occurs during health centre visits** for vaccination campaigns. Doctors and nurses identify children using a set of criteria based on mid-upper arm circumference, weight-for-height/length ratio and bilateral pitting oedema. Children who are not reached by these campaigns might go unidentified.
- **Lack of surveillance system to track malnutrition:** MoHSPP heavily relies on Demographic and Health Surveys, and Micronutrient surveys, which occur every five years, and the data is available at the regional level. This results in inaccurate planning for product forecasting at the district level.

Second, not all identified children with MAM/SAM undergo treatment with RUTF/RUSF due to various reasons:

- **Non-availability of RUTF/RUSF:** Hospitals have restricted reserves of RUTF/RUSF and are unable to provide the necessary quantity. Some Tajik districts are not included in current programmes and have no access to them.
- **Low acceptability of RUTF/RUSF**: RUTF/RUSF possesses a distinct taste that may differ from local preferences, leading to reluctance among many children to consume them.
- **RUTF/RUSF sharing and sales:** Families may share RUTF/RUSF with other members or occasionally sell them. This often explains situations where children are reported to have received treatment but show no noticeable improvements.
- **Distance to health facilities**: Families residing far from health facilities may struggle to visit them regularly to collect RUTF/RUSF. This is especially the case for families living in remote areas.
- **Halal status:** Some families were reported to be concerned about whether the product is halal or not, and they preferred not to give it to their children.

5.2.2. DEMAND IN TAJIKISTAN

In the short term, the demand for RUTF and RUSF in Tajikistan will depend on the budgets of UNICEF, WFP, and AKDN, as well as the government's willingness to take over the funding for addressing children's malnutrition. UNICEF and WFP orders are correlated with the available budget. As a result, the quantity of RUTF/RUSF that they purchase fluctuates heavily, and they are unable to predict volumes beyond a one-year timeframe.

Limited visibility on the forecasted volume will be a major challenge in convincing a food processor to invest in RUTF/RUSF processing.

In the long run, UNICEF and WFP have expressed their willingness to progressively reduce funding for RUTF and RUSF in Tajikistan, while AKDN is anticipated to continue its activity. As a result, the long-term demand will be **heavily dependent on the government's willingness to start allocating funding for RUTF/RUSF purchases**.

Without a guarantee that the Tajik government will pay for RUTF/RUSF in the long run, there will be limited interest from food processors.

5.2.3. DEMAND IN NEIGHBOURING COUNTRIES

Tajikistan is not the only country in the region with children suffering from MAM and SAM. By targeting buyers in other countries, the addressable market could significantly increase.

Between 2022 and January 2024, UNICEF placed orders for the following volumes of RUTF[31]:

- **Afghanistan: 21,500MT** - This country constitutes 11% of UNICEF's global RUTF orders, and its proximity to Tajikistan presents a significant opportunity. In 2022, WFP had also planned to supply 68,000MT of RUSF to Afghanistan.[32]
- **Pakistan: 13,200MT** - Despite being a promising market, competing against Ismail Nutrition, a Pakistani producer of UNICEF-certified RUTF/RUSF, poses a challenge.
- **Uzbekistan: 830 kg -** Serving Uzbekistan from Tajikistan would be convenient, but the volume is limited.

Except for Tajikistan, **other countries in Central Asia do not have an IMAM programme**, and, despite the existence of SAM and MAM cases, governments do not purchase RUTF on their own to treat children suffering from SAM.

However, if **export opportunities theoretically exist in the region** (notably to Afghanistan and Pakistan), exporting to these countries will be challenging:

[31] UNICEF – RUTF Market Dashboard
[32] WFP – 2022 Annual Country Report Afghanistan

- **There is already a strong and very competitive producer of RUTF and RUSF in Pakistan** (Ismail Nutrition).
- Exporting to Afghanistan and Pakistan will either require:
    - **Obtaining the UNICEF/WFP certification** (to export by selling to the UNICEF/WFP supply divisions).
    - **Obtaining local certification in Afghanistan** (which has poor relations with Tajikstandard and is unlikely to accept a product that has only been certified locally in Tajikistan) **and in Pakistan** (which could also facilitate the entry of the Pakistani producer in Tajikistan, thereby compromising the business opportunity for the Tajik producer).

More details on the different certifications and standards are provided later in the report.

5.2.4. ANTICIPATED VOLUMES

Regarding the anticipated volume of RUTF/RUSF in Tajikistan, three main scenarios are possible:

- **Low**: Current buyers of RUTF/RUSF see their budget decrease, and the government does not take over the funding. Consequently, there is no buyer for RUTF/RUSF.
- **Medium**: The current buyers continue to purchase as they have over the last few years, and the government does not assume the funding. Between 2020 and 2022, UNICEF purchased on average 30,500kg of RUTF annually, WFP purchased on average 22,300kg of RUSF annually, and AKDN purchased on average 3,600kg of RUSF annually.
- **High**: The government starts purchasing RUTF/RUSF and manages to treat 25% of the SAM/MAM cases.[33]

Based on these scenarios and assuming **48,100 SAM cases in Tajikistan and that 150 sachets of RUTF** (~13.8kg per child) are necessary to completely treat one case of SAM, the projected annual volume of RUTF per scenario would be:

[33] This coverage of 25% has been decided arbitrarily by Altai Consulting to make hypothesis for the feasibility model. The exact number would result from a strategic decision of the Ministry of Health, taking into account (notably) the budget available. This parameter can be modified in the Excel model accompanying this report, so as to enable UNICEF and its partners to refine the hypothesis once a decision on the coverage rate has been taken by the government.

Anticipated annual volume of RUTF per scenario			
	Low	Medium	High
% of cases treated annually	0%	4,6%	25%
Volume of RUTF per year	0 MT	30 MT	166 MT

Similarly, based on these scenarios and assuming **101,600 SAM cases in Tajikistan and that 60 sachets of RUSF** are necessary to dully treat one case of MAM, the projected annual volume of RUSF per scenario would be:

Anticipated annual volume of RUSF per scenario			
	Low	Medium	High
% of cases treated annually	0%	4,6%	25%
Volume of RUSF per year	0 MT	26 MT	140 MT

In the Excel model, the expected volumes of RUTF/RUSF vary based on three main parameters: the estimated burden, the proportion of MAM/SAM cases treated with RUTF/RUSF, and the number of sachets per child.

6. POTENTIAL LOCAL RUTF & RUSF SUPPLY

6.1. REGULATORY CONSTRAINTS

6.1.1. TAJIK NORMS, REGULATIONS & STANDARDS

If a local producer is willing to produce RUTF or RUSF locally, it will have to comply with Tajik norms, regulations, and standards. The main norms, regulations, and standards that would apply to a local RUTF/RUSF producer include:

- The **2012 law on food safety**, which outlines the main rules that must be followed by food producers and the sanctions applying to those not complying.
- The **technical regulations**, which provide directives on how to implement the laws.
- The **sanitary norms** of the MoHSPP.

A **controlling entity from the MoHSPP (SES**) would oversee the facility to ensure compliance with sanitary and epidemiological norms. Due to the nature of RUTF/RUSF products, the production is likely to be categorized as “high risk” by SES, leading to **biannual scheduled inspections**, supplemented by spontaneous surprise controls conducted by SES.

At this stage, it remains uncertain whether RUTF (and, to a lesser extent, RUSF) would be classified as medicine in Tajikistan. This clarification can be sought as the project progresses, and discussions on national standards for RUTF/RUSF are underway with the various stakeholders involved (see below for more details). If RUTF is categorized as medicine, the producer would need to adhere to additional laws, such as the **2022 law on medicine, medical goods, and pharmaceutical activities**. Moreover, the manufacturing process would be subject to scrutiny by an additional entity of the MoHSPP, responsible for overseeing medicine production, in addition to the regular inspections by SES for food products.

As RUTF/RUSF are not currently manufactured in Tajikistan, there are no local standards for these products. Consequently, new standards will need to be established to facilitate the local producer's product approval by Tajikstandard. The process is as follows:

- The local producer provides Tajikstandard with information on international standards for RUTF/RUSF (such as RUTF Codex Alimentarius, ISO, etc.).
- Tajikstandard establishes a working group comprising all relevant stakeholders, which may include the MoHSPP, the Ministry of Industry, the National Nutrition Centre, etc.
- Tajikstandard examines the international standards for RUTF/RUSF, assesses their compatibility with existing laws in Tajikistan, and verifies whether they have the capacity to conduct testing on these standards in-country (to ensure Tajikstandard has the capacity to certify the products).

- Tajikstandard shares these findings with the working group, initiating discussions to reach a consensus on adapting international standards to the Tajik context. This process involves considering existing laws and Tajikstandard's testing/certification capacity.
- Once a consensus is reached, each entity within the working group validates the new standards, and Tajikstandard officially registers them.

The entire process is likely to last between 6 months to one year.

6.1.2. REGIONAL STANDARDS FOR EXPORTS

If the local producer considers exporting its product to other countries in the region, it may explore the option of requesting the creation of bilateral or regional standards. This approach would ensure that the Tajik producer's RUTF/RUSF automatically complies with the standards of the target countries, eliminating the need to adhere to additional standards for export. The process for drafting bilateral and regional standards varies depending on the target countries. Here are some examples:

- **Regional GOST Standard**: Valid throughout the CIS (Commonwealth of Independent States) region, Tajikstandard can be approached to create an international working group with counterparts from GOST countries. Together, they can design new regional standards.
- **Pakistan**: Tajikstandard has established good relationships with its Pakistani counterpart, making it possible to design bilateral standards. However, Pakistan already has standards for RUTF and RUSF. In this case, Tajikistan might consider adopting the existing Pakistani standards to facilitate exports. While this would enable Tajik producers to export to Pakistan, it could also open the Tajik market to already successful Pakistani producers of RUTF/RUSF, posing a potential challenge for local producers looking to launch their production.
- **Afghanistan**: Unfortunately, Tajikstandard currently has no relationship with its Afghan counterpart. In such a scenario, complying with ISO standards would be the optimal choice to target the Afghan market from a standard perspective.

6.1.3. UNICEF/WFP CERTIFICATIONS

UNICEF and WFP have their certification processes to verify that suppliers have the capacity to produce RUTF and RUSF, adhering to very strict quality control standards. The list of certified suppliers is widely used by most buyers of RUTF and RUSF (e.g. USAID). While obtaining certification may not be mandatory to serve the Tajik market – as UNICEF/WFP may find alternative solutions such as providing funding to the government for purchasing – non-certified producers would be ineligible for UNICEF/WFP procurement. Obtaining these certifications is nearly mandatory for a producer looking to serve markets outside of Tajikistan.

6.2. INVESTMENT REQUIRED

6.2.1. HYPOTHESES

The investment needed depends on two main parameters:

- **What will be the anticipated volume of production?** The equipment cost varies based on the targeted annual production capacity.
- **Will the factory be greenfield or brownfield?** Establishing a new factory is a very expensive and challenging process to estimate. For a brownfield project, the investment will depend on several factors, including the available space in its existing facilities, the timeline, and the locations of the facilities.

The business plan detailed in the upcoming sections is based on high-level estimates derived from existing RUTF factories and recent RUTF projects.

6.2.2. EQUIPMENT

To initiate the production of RUTF/RUSF, a comprehensive list of equipment is required, including ISO tanks, mixer auxiliary equipment, auto multi-head sachet filler, steam boiler, water chiller + air handling unit, X-ray & case check weigher, air compressor, change-over generator, mixer installation cost, LPG gas supply unit & tank, transformer, main mixer shipment cost, leak tester - non-destructive, shrouding machine, mixer containers + demurrage, power switchboard/LV panel, power switch gear (RMU), jet coder - batch coder case, diesel tank and supply system, and case sealer.

The value of the equipment[34] depends on the targeted production capacity. Based on previous projects, the estimated values are as follows:

Cost estimates	Annual production capacity				
	250MT	500MT	1,000MT	2,000MT	3,600MT
Equipment	$ 500,000	$ 800,000	$ 1,200,000	$ 1,200,000	$ 1,300,000

[34] Incorporating both equipment and installation expenses while excluding delivery and clearance costs. Given that such equipment has never been imported into Tajikistan, there is no available information on delivery and clearance expenses. Precise figures can only be acquired once the project materialises, and quotations are sought from equipment suppliers. In the model, an additional 20% has been included in the equipment costs to accommodate these supplementary expenses.

6.2.3. PRODUCTION SITE

In the case of a greenfield factory, additional investment will be needed to cover a wide range of costs, including building regulatory approvals, architect professional fees, substructure, superstructure, building finishes, utility buildings, power supply, internal lighting, electrical installation labour, metering board, earthing system, fire alarm system, water, sewerage & fire fighting, labour for water & sewerage, structured cabling, security lighting, professional fees, access roads, parking & landscaping, perimeter wall, safety & internal fence, ISO tanks platform, FSQ systems, audits & product registration, site registration, etc.

The costs of the production site for a greenfield project also depend on the targeted production capacity:

Cost estimates	Annual production capacity				
	250MT	500MT	1,000MT	2,000MT	3,600MT
Production site	$ 300,000	$ 500,000	$ 800,000	$ 800,000	$ 850,000

These estimates are very high-level, dependent on many criteria not defined at this stage, and will need to be refined later in the project.

6.2.4. SOURCES OF FINANCING

The investment needed to establish local production of RUTF/RUSF is estimated to range between one and two million dollars. This amount is non-negligible for most Tajik producers, who are likely to require external funding (in either debt or equity).

RUTF/RUSF production is however considered risky by investors from a business perspective:

- **RUTF businesses rely on very few clients**, making them very dependent. Should one organisation (e.g. UNICEF supply division) stop purchasing from them and they can almost immediately go bankrupt.
- **There is very limited visibility on the future demand for RUTF/RUSF products** at the global level, and hence on the business perspectives of a given producer. Demand largely depends on funding and funding allocated to RUTF/RUSF is decided on a yearly basis (no long-term planning). In addition, RUTF/RUSF demand by region will vary depending on how donors prioritise the different countries in need. As a result, it is very difficult to anticipate the demand for RUTF/RUSF products.

- **RUTF/RUSF production is a very niche sector, that many investors do not understand well.** They are therefore very hesitant to invest in such businesses.

Based on these observations, it is therefore **very unlikely that private investors** (private funds, banks, etc.) in Tajikistan will be willing to invest in such a project.

Development finance institutions (IFC, EBRD, ISDB, etc.) **are therefore more likely investors** for such a project. Local RUTF/RUSF production indeed appeals to them as it can have a positive social/development impact. However, **even with such investors, raising funds for such a project in Tajikistan is expected to be tough:**

- Despite being more sensible about the social impact of their investment, **DFIs still seek to invest in projects that have some return-on-investment potential.** They will have the same fears as private investors when looking at the RUTF/RUSF business models (dependence on a few clients, limited visibility on future demand, etc.).
- **The business environment in Tajikistan is not perceived as very attractive by international investors** (small market size, lack of an enabling business environment, etc.). Between 1991 and 2013, only two Tajik food processing projects received foreign investment ($13m for the Obi Zulol water bottling plant and $4m for a fruit and vegetable juice packaging line).[35]
- **Experience of local RUTF/RUSF producers in other countries shows that even with DFIs**, and even when one's business is already operating, has all the international certifications from UNICEF and WFP, and works in large markets (East Africa), **securing funding can be very tough**. This experience was shared by a local RUTF producer in East Africa, who was very transparent about the challenges of this industry.

If the project were to materialise, **DFIs (IFC, EBRD, ISDB, European and American DFIs, etc.) should be contacted in priority** to identify funding opportunities, as they are the most likely to be willing to support such a project. **The local Tajik producer should however come with a very strong business plan, and most importantly with a clear commitment from the Tajik government**, so it can prove that it will have a loyal and committed client to purchase its products.

[35] US commercial service, Doing Business in (Tajikistan): 2014 Country Commercial Guide for U.S. Companies

7. RUTF & RUSF RECIPES

7.1. RUTF/RUSF INGREDIENTS

7.1.1. COMPOSITION

RUTF is made of ingredients embedded in a lipid-rich matrix (paste or biscuit), resulting in an energy- and nutrient-dense food. The following raw materials are suitable ingredients for the production of RUTF[36]:

- **Milk & other dairy products:** whole milk powder, skimmed milk powder, whey powder (at least 50% of protein from milk products).
- **Legumes & seeds**: soybeans, lentils, chickpeas, cowpeas, beans, peanuts, sesame, and other types of legumes and seeds (excluding field beans or fava beans because of the danger of favism).
- **Fats & oils** (excluding partially hydrogenated fats and oils).
- **Cereals, roots, & tubers** and their derived products.
- **Vitamins & minerals.**
- **Carbohydrates**: precooked and/or gelatinized plant starch, lactose, maltodextrin, sucrose (excluding glucose, fructose, as well as honey due to the risk of infant botulism).
- **Food additives**: emulsifier, antioxidant, acidity regulator, packaging gas, and carrier.

7.1.2. LOCALLY AVAILABLE INGREDIENTS

Tajikistan produces a wide range of ingredients that may be used in the production of RUTF/RUSF (not exhaustive):

- **Legumes & seeds**: peanuts, chickpeas, lentils, soybeans, peas, beans, sesame.
- **Fats & oils**: cotton oil, sunflower oil.
- **Cereals, roots, & tubers:** maize, rice, wheat, barley, oats, millet.

There is no local production of milk powder, milk powder and whey powder, which are usually imported from Belarus. Similarly, other ingredients (vitamins, minerals, carbohydrates) must be imported from neighbouring countries.

All products produced in Tajikistan may also be imported, as there is no guarantee that local products are significantly cheaper than imported ones.

[36] CODEX ALIMENTARIUS – Guidelines for Ready-to-Use Therapeutic Foods

7.1.3. COST OF INGREDIENTS

The costs of ingredients composing RUTF and RUSF have been evaluated based on customs data combined with a few interviews with potential suppliers. The costs per ingredient per MT used in the Excel model are as follows:

- Peanuts: $1,000
- Chickpeas: $428
- Milk powder: $1,439
- Sugar: $608
- Palm oil: $786
- Soy oil: $1,216
- Emulsifier: $2,759
- Vitamin & mineral mix: $9,500

These estimates should be considered cautiously due to the volatility of commodity prices as well as any additional costs that may add up to these amounts (e.g., transportation, wholesalers' margin).

If the project were to materialize, the local producer would need to **make a strategic decision for each raw ingredient, determining whether it should be imported or sourced locally**. Imported ingredients can indeed be competitive, as they are generally produced in countries that produce very large volumes and therefore have low production costs. However, a local Tajik producer may be able to negotiate advantageous prices with local producers by committing to yearly volumes of purchase and fixed prices. A local producer could also value buying raw ingredients locally to ensure the continuity of the supply. Tenders should therefore be launched by the local producer to compare both options (imports or local supply) and make the best strategic decision for the business.

7.2. POSSIBLE RUTF & RUSF RECIPES

7.2.1. PEANUT PASTE

Peanut paste is the original RUTF recipe developed by Nutriset in 1996 under the brand name PlumpyNut. The main ingredients are[37]:

- Milk & dairy ingredients.
- Peanuts & peanut paste.
- Soy-based ingredients (e.g., soy flour, soy isolate).
- Edible refined vegetable oil.
- Other ingredients (vitamins & minerals, carbohydrates, food additives).

[37] UNICEF - Product Specification Sheets Ready-to-Use Therapeutic Food Paste (S0000240)

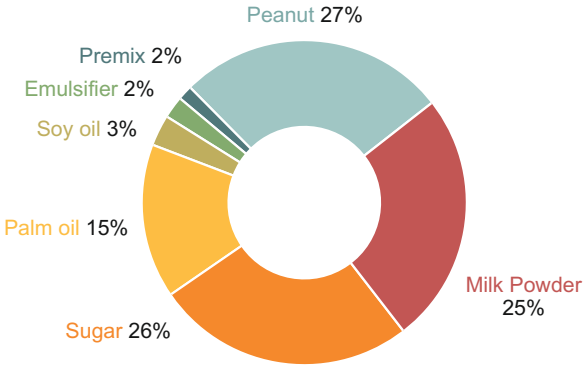
While initially produced exclusively by Nutriset, RUTF peanut paste production has gradually expanded to involve other companies and NGOs in various locations. In 2005, Nutriset established a network of franchisees known as the Plumpy'Field Network. These franchisees are granted the rights to use Nutriset brands, receive technical and commercial know-how transfers, and benefit from continuous assistance. In 2010, following a campaign by two NGOs to enhance access to RUTF in developing countries, the PlumpyNut patent was made publicly available.

The peanut paste is still the most common recipe of RUTF and is currently produced by more than 20+ producers worldwide, with most of them located in countries of consumption. Nearly all RUTF producers also manufacture RUSF using the same peanut paste recipe.

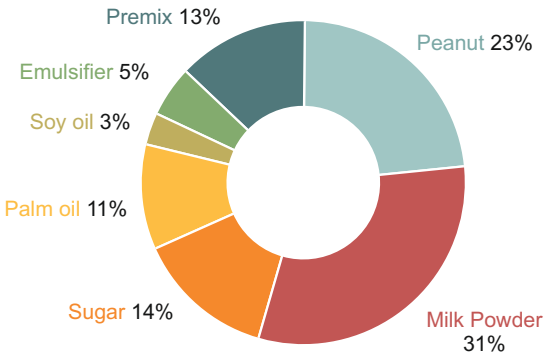
Producing RUTF using the peanut paste recipe in Tajikistan would cost approximately **$15.90 per carton of RUTF** and $**17.28 per carton of RUSF** with the following composition:

Peanut paste

Ingredient composition



Cost composition



7.2.2. RUTF BISCUIT

The RUTF biscuit is relatively uncommon. Currently, GC Rieber Compact is the exclusive provider of RUTF biscuits to UNICEF worldwide[38], manufacturing them at their processing plant in Norway under the brand name BP-100. RUTF biscuits are compressed bars composed of[39]:

[38] GC Rieber Compact also manufactures RUSF and RUTF based on the peanut recipe, marketed under the brands eeZeePaste and eeZeeRUSF

[39] UNICEF - Product Specification Sheets Ready-to-Use Therapeutic Food Biscuit (S0000242)

- Pre-cooked cereals.
- Milk powder.
- Vegetable oil.
- Other ingredients (vitamins, minerals, and carbohydrates).

The precise composition of BP-100 is not publicly available and it is unclear whether it is still protected by a patent or not.

7.2.3. CHICKPEA PASTE

UNICEF released the product specification sheet for a RUTF based on chickpeas in 2023 but has not yet purchased any as of December 2023. Chickpea paste is made of[40]:

- Milk & dairy ingredients.
- Chickpeas.
- Edible refined vegetable oil.
- Other ingredients (vitamins & minerals, carbohydrates, food additives).

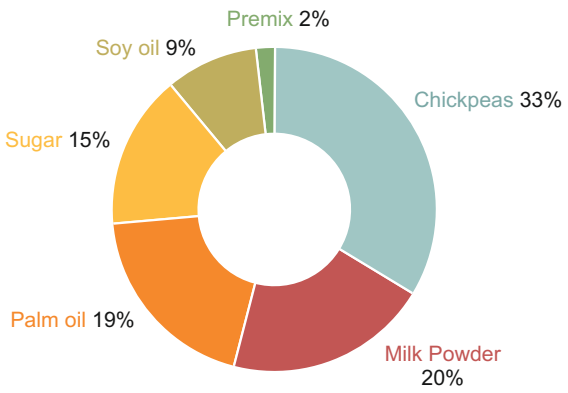
Ismail Nutrition, an RUTF/RUSF producer based in Pakistan, has already started to produce RUSF using chickpea paste under the brand name Acha Mum. This type of RUSF is already available in Tajikistan. Several sensory acceptability assessments were also conducted using this recipe (e.g., GUTs Agro Industry in Ethiopia, icddr,b in Bangladesh).

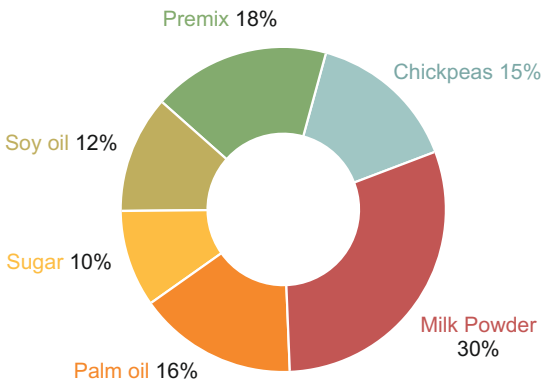
Producing RUTF using the chickpea recipe in Tajikistan would cost approximately **$13.30 per carton of RUTF** and $**14.46 per carton of RUSF** with the following composition:

[40] UNICEF - Product Specification Sheets Ready-to-Use Therapeutic Food Chickpea (S0000326)

Chickpea paste

Ingredient composition	Cost composition





7.2.4. OTHER RECIPES

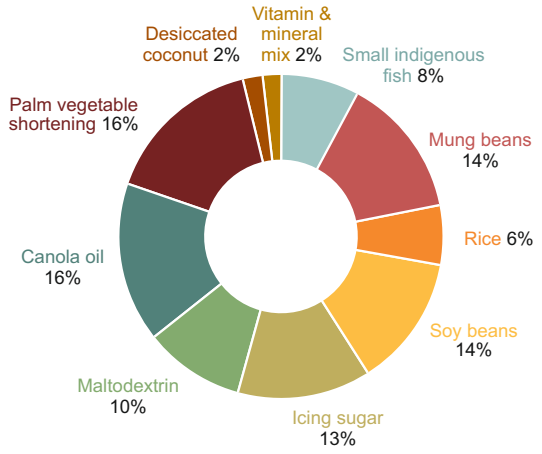
There have been many attempts to explore alternative formulations for RUTF and RUSF that are more suitable to local contexts. Among others, the Institut de Recherche pour le Développement (IRD) has experience and has worked on several new recipes:

- **Vietnam**: In 2009, Vietnam's National Institute of Nutrition, IRD, and UNICEF collaborated to develop a RUTF recipe based on rice, soy, and mung beans called the High-Energy Bar for Integrated Management of Acute Malnutrition (HEBI).[41]
- **Cambodia**: In 2018, IRD and UNICEF developed a recipe for RUTF and RUSF called Nutrix (ex. Num Trey), based on fish, mung beans, rice and soya beans.[42]

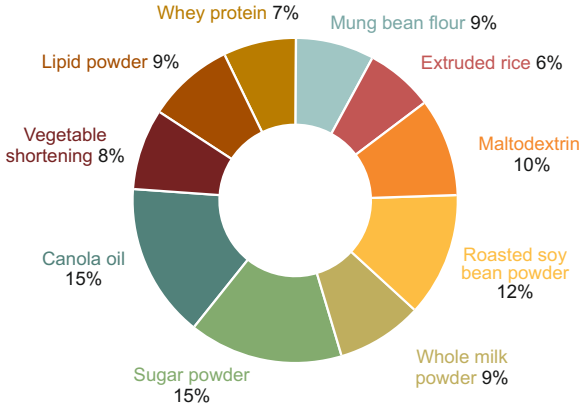
[41] Acceptability of Two Ready-to-Use Therapeutic Foods among HIV Positive Patients in Vietnam
[42] Development and Acceptability of Locally Made Fish-Based, Ready-to-Use Products for the Prevention and Treatment of Malnutrition in Cambodia

Composition of alternative RUTF recipes

Nutrix - Cambodia



HEBI - Vietnam



While the French government covers the costs of developing the recipe at IRD, **the acceptability research and other associated expenses amount to approximately $215,000 to $325,000**. The costs for a private company without any support from institutions such as IRD are estimated to be higher.

7.3. RECIPE SELECTION

7.3.1. KEY CRITERIA

Several criteria must be considered when defining the appropriate recipe:

- **Who are the anticipated customers?** If UNICEF, WFP, USAID, and other international institutions are expected to purchase the products directly, the producer must use a recipe that has already been approved by UNICEF and USAID. However, the producer could also decide to only obtain approval for a new recipe from the local government, in which case he will be able to sell locally to the local government (but not internationally or to international stakeholders).
- **What is the acceptability rate?** The main purpose of RUTF/RUSF can be achieved only with a high acceptability rate, meaning a recipe well suited to local taste.
- **What are the production costs?** Different ingredients have varying prices, and production costs are usually the main reasons behind researching a new recipe.
- **What is the expected timeline?** Developing a new recipe can take up to 2 years, due to the creation of the potential recipes, the assessment of the most relevant one, and the kickstart of production.
- **Is the recipe patented?** Some RUTF/RUSF recipes may be patented.

7.3.2. ASSESSMENT OF RUTF/RUSF RECIPES

Due to the very high similarity in terms of composition and production process between RUTF and RUSF, **choosing the same recipe for both products** would be relevant to optimize costs.

Recipe	UNICEF's certification	Ingredients' costs	Development costs	Timeline	Patent	Acceptability rate
Peanut paste *(e.g., Plumpy'nut)*	Yes	$ 15.90 *per carton of RUTF*	No	Short-term	No	*Unknown*
Biscuit *(e.g., BP-100)*	Yes	*Unknown*	Yes *Composition not available*	Short-term	*Unknown*	High
Chickpea paste	Yes	$ 13.30 *per carton of RUTF*	No	Short-term	*Unknown*	High
New recipe	No	*Unknown*	Yes	Long-term	No	*Unknown*

The two main recipes that stand out are peanut paste and chickpea paste. While peanut paste is the most common recipe and is not patented, chickpea paste may be more adapted to local taste and cheaper to produce. However, given the novelty of the chickpea recipe, it is not clear if and what exactly in this recipe is patented, and whether UNICEF supply is now willing to purchase chickpea RUTF (despite product specifications being published in early 2023, it has never been done so far).

8. FEASIBILITY & DESIRABILITY OF LOCAL RUTF & RUSF PRODUCTION IN TAJIKISTAN

8.1. LOCAL CAPACITY

8.1.1. INGREDIENTS

Regardless of the recipe used, most of the ingredients required for RUTF production can be found in Tajik markets. While most of them are produced locally (e.g., peanuts, chickpeas), their compliance with the required standards will need to be further evaluated to avoid the risk of aflatoxin in peanuts for instance.

The minerals and vitamins premix will need to be imported, potentially from India and China which are the largest exporters to the region.

8.1.2. PRODUCTION

As potential partners for this project, Altai has focused on established local food processors that may be willing to expand their activities to other product categories. This is motivated by three main reasons:

- Doing business in Tajikistan is very challenging, especially for a foreign company without any network (ranked 106th in World Bank - Ease of Doing Business Survey 2020). Working with a local private business, that is already used to navigating the Tajik business environment will be key to the success of the project.
- The Tajik government is more likely to support the project if the producer is a local Tajik company (rather than if it is a foreign one).
- A food processing company may leverage existing equipment and staff, as well as the processes it has in place to comply with the Tajik food laws and standards.

Tajikistan's food processing companies mostly focus on producing juices, jars, jams, fruit bars etc. Altai visited four companies in Dushanbe and Sughd to assess their production capacity:

Obi Zulol

- **Production sites:** Dushanbe, Istaravshan
- **Products:** Water, soda, juices, drinkable fruit sauces, food for children, nutritional food for athletes
- **Partners/Clients:** RC Cola, US Army, French Ministry of Defense, etc.
- **Quality control:** 12 employees, accredited in-house laboratory (HACCP)
- **Certifications:** ISO 22000
- **Financing:** Received support from EBRD in 1998 to finance a $12.6m processing plant ($1.7m equity & $3.5m redeemable shares), support from OPIC

Barakat Isfara

- **Production sites:** Isfara (x2)
- **# of employees:** 130
- **Products:** Organic dried fruits, fruit bars, fruit disks
- **Volume:** 200 MT/month of dried fruits, 20-50MT/month of bars & fruit disks
- **Exports:** Czech Republic, Germany
- **Quality control:** 7 employees, in-house laboratory
- **Financing:** $3m to build the factory
- **Certifications:** ISO 22000, HACCP, FSSC 22000
- **Award:** USAID Best Exporter of the Year 2013

Subhi Vatan

- **Production sites:** Isfara
- **Products:** Juices, jams, dried fruits, baby food, tomato sauces, etc.
- **Revenue:** $275,000 in 2020
- **Volume:** More than one million jars per year
- **Exports:** 70% of the production is exported, mostly to Russia, Kazakhstan, USA and Ukraine
- **Quality control:** 3 employees, in-house laboratory
- **Certifications:** ISO 22000, GOST, HACCP

Mersi Baku

- **Production site:** Khujand
- **# of employees:** 60
- **Products:** Juices
- **Exports:** Afghanistan, Kirgizstan, Turkmenistan
- **Quality control:** 4 employees, in-house laboratory
- **Сертификации:** ISO 22000, GOST

Two out of the four companies visited stand out as the most promising partners:

- **Obi Zulol** is one of the largest food producers in Tajikistan, experienced in producing children's food (therefore following the strict quality requirements), and holds a very good reputation among the institutions interviewed during the assessment. The company is also regularly audited, has a strong financial capacity, good relationships with the government, and has already been supported by the EBRD.
- **Barakat Isfara** produces food bars and fruit discs using methods closer to RUTF/RUSF production. The company has several international certifications and won the Central Asian Exports of the Year award from USAID in 2023.

Obi Zulol baby food products

Barakat Isfara fruit bar

A more in-depth evaluation will be required to assess their willingness to initiate the production of RUTF/RUSF products, as well as to examine the available equipment and space for RUTF/RUSF processing.

Obi Zulol modern factory in Istaravchan

8.1.3. WORKFORCE

To produce RUTF, a producer will need to employ a diverse workforce in the factory with varying levels of qualifications:

- **FTE with basic qualifications**: filling operators, packers, warehouse workers, housekeepers, laundry attendants.
- **FTE with intermediate qualifications**: forklift drivers, mixing operators.
- **FTE with advanced qualifications**: supervisors, food scientists (for quality control and testing), one production manager.

The estimated number of Full-Time Equivalents (FTEs) required will depend on the equipment, which, is contingent on the project's production capacity:

Estimated number of FTE	Annual production capacity				
	250MT	500MT	1,000MT	2,000MT	3,600MT
FTE with basic qualification	# 10	# 10	# 10	# 13	# 13
FTE with intermediate qualification	# 4	# 4	# 5	# 5	# 5
FTE with advanced qualification	# 5	# 5	# 5	# 8	# 8

Labour costs are relatively inexpensive in Tajikistan compared to most RUTF/RUSF-producing countries. In the Excel model, the following wages have been used to calculate compensation for different levels of qualifications:

- **FTE with basic qualifications**: $60 monthly, $720 annually.
- **FTE with intermediate qualifications**: $130 monthly, $1,560 annually.
- **FTE with advanced qualifications**: $200 monthly, $2,400 annually.

However, the recruitment of qualified candidates is anticipated to be quite challenging. Collaborating with an already-established food processor would greatly facilitate the hiring process.

The FTE with advanced qualifications will also need to undergo specific training to work in a certified factory. According to interviews with other RUTF/RUSF processors, the primary training is estimated to cost approximately $1,000 per employee.

8.1.4. CERTIFICATIONS

One Tajik producer (Obi Zulol) and a **few others have been identified as having the capacity to produce food products (including for children) following international norms** (ISO, HACCP, etc.). Obtaining local (Tajikstandard) and international (GOST standard) certifications should therefore be possible for them.

Barakat Isfara FSSC Certificate of registration

As for any producers, obtaining the UNICEF and WFP certifications is a very tough process and will require time (at least 2 years). Provided that the Tajik producer invests in the right equipment and talents it should however **be able to obtain these certifications**, as many other producers in even more challenging environments (Sudan, Haiti, etc.) managed to do.

8.2. FINANCIAL VIABILITY

An Excel model accompanies this report. It is a tool to simulate the impact of different scenarios on the business plan of a potential Tajik RUTF producer. The section below presents the main hypothesis of this model, as well as the results of a few possible scenarios. These scenarios will have to be refined by UNICEF and its partners at a later stage, once more visibility on the local RUTF production project is available (budget available, coverage rate targeted, etc.).

8.2.1. KEY HYPOTHESIS

The Excel model assesses the financial viability of producing RUTF/RUSF in Tajikistan. The main scenarios presented in this report are based on the number of children treated and the products produced. The report encompasses five potential factory sizes: 250MT, 500MT, 1,000MT, 2,000MT, and 3,600MT.

To standardize and facilitate comparison between different scenarios, the following parameters are fixed:

- Estimated burden of SAM: 48,100
- Estimated burden of MAM: 101,600
- Number of RUTF per child treated: 150
- Number of RUSF per child treated: 60

- Price per carton (150 sachets) of RUTF: $53 (last price paid by UNICEF)
- Price per carton (150 sachets) of RUSF: $41 (last price paid by WFP)
- Recipe: Peanut paste
- Brownfield project
- Constant RUTF/RUSF demand over the years
- Training cost per FTE with advanced qualification: $1,000
- Turnover of FTE with advanced qualification: 20%
- Miscellaneous investment costs: 20% of equipment + factory site costs

Each of them is editable in the Excel version of the business plan and will be refined later in the project.

8.2.2. SCENARIO 1: 4.6% OF SAM – 0% OF MAM

Rationale:

- The producer produces only RUTF.
- The producer supplies UNICEF.
- UNICEF's available funding aligns with recent budgets: Between 2020 and 2022, UNICEF purchased on average 30,500kg of RUTF annually.
- The government does not allocate any additional funding.

Hypotheses:

- % of SAM cases in Tajikistan treated with RUTF: 4.6%.
- % of MAM cases in Tajikistan treated with RUSF: 0%.
- No exports.

Production volume:

Production volume:	Tajikistan		Outside of Tajikistan	Total
	# of cases treated	% of total	# of cases treated	Volume of RUTF/RUSF
Severe Acute Malnutrition (SAM)	2 213	4,6	-	31 MT
Moderate Acute Malnutrition (SAM)	-	-	-	
Total	**2 213**			**31 MT**

Business Plan:

Factory production capacity	250 MT
Equipment cost	$500 000
Factory site costs	$300 000
Development of a new recipe	-
Miscellaneous	$160 000
Investment required	**$960 000**
Revenue from RUTF	$117 108
Revenue from RUSF	-
Revenue	**$117 108**
Ingredient costs	$35 188
Packaging costs	$9 496
Labour costs (including training)	$26 440
Overhead costs	$180 000
Earnings before interest and taxes (EBIT)	**-$134 016**
Pay-back period (assuming fixed volume and price)	*Negative EBIT*

In this scenario, local RUTF production is not financially viable.

8.2.3. SCENARIO 2: 25% OF SAM – 0% OF MAM

Rationale:

- The producer produces only RUTF.
- The government allocates funding to treat 25% of SAM cases (~$640,000).

Hypotheses:

- % of SAM cases in Tajikistan treated with RUTF: 25%.
- % of MAM cases in Tajikistan treated with RUSF: 0%.
- No exports.

Production volume:

Production volume:	Tajikistan		Outside of Tajikistan	Total
	# of cases treated	% of total	# of cases treated	Volume of RUTF/RUSF
Severe Acute Malnutrition (SAM)	12 028	25,0%	-	166 MT
Moderate Acute Malnutrition (SAM)	-	-	-	
Total	**12 028**			**166 MT**

Business Plan:

Factory production capacity	250 MT
Equipment cost	$500 000
Factory site costs	$300 000
Development of a new recipe	-
Miscellaneous	$160 000
Investment required	**$960 000**
Revenue from RUTF	$636 459
Revenue from RUSF	-
Revenue	**$636 459**
Ingredient costs	$191 240
Packaging costs	$51 610
Labour costs (including training)	$26 440
Overhead costs	$180 000
Earnings before interest and taxes (EBIT)	**$187 168**
Pay-back period (assuming fixed volume and price)	*5,1 years*

In this scenario, local RUTF production is financially viable, and the investment pays back in 5.1 years.

8.2.4. SCENARIO 3: 4.6% OF SAM – 4.6% OF MAM

Rationale:

- The producer produces RUTF & RUSF.
- The producer supplies UNICEF, WFP and AKDN.
- Their available funding aligns with recent budgets: Between 2020 and 2022, UNICEF purchased on average 30,500kg of RUTF annually, WFP purchased

on average 22,300kg of RUSF annually, and AKDN purchased on average 3,600kg of RUSF annually.

- The government does not allocate any additional funding.

Hypotheses:

- % of SAM cases in Tajikistan treated with RUTF: 4.6%.
- % of MAM cases in Tajikistan treated with RUSF: 4.6%.
- No exports.

Production volume:

Production volume:	Tajikistan		Outside of Tajikistan	Total
	# of cases treated	% of total	# of cases treated	Volume of RUTF/RUSF
Severe Acute Malnutrition (SAM)	2 213	4,6%	-	31 MT
Moderate Acute Malnutrition (SAM)	4 672	4,6%	-	28 MT
Total	**6 885**		**-**	**59 MT**

Business Plan:

Factory production capacity	250 MT
Equipment cost	$500 000
Factory site costs	$300 000
Development of a new recipe	-
Miscellaneous	$160 000
Investment required	**$960 000**
Revenue from RUTF	$117 108
Revenue from RUSF	$77 179
Revenue	**$194 288**
Ingredient costs	$67 487
Packaging costs	$17 515
Labour costs (including training)	$26 440
Overhead costs	$180 000
Earnings before interest and taxes (EBIT)	**-$97 154**
Pay-back period (assuming fixed volume and price)	*Negative EBIT*

In this scenario, local RUTF production is not financially viable.

8.2.5. SCENARIO 4: 25% OF SAM – 25% OF MAM

Rationale:

- The producer produces RUTF and RUSF.
- The government allocates funding to treat 25% of SAM cases (~$640,000) and 25% of MAM cases (~$420,000).

Hypotheses:

- % of SAM cases in Tajikistan treated with RUTF: 25%.
- % of MAM cases in Tajikistan treated with RUSF: 25%.
- No exports.

Production volume:

Production volume:	Tajikistan		Outside of Tajikistan	Total
	# of cases treated	% of total	# of cases treated	Volume of RUTF/RUSF
Severe Acute Malnutrition (SAM)	12 028	25%	-	166 MT
Moderate Acute Malnutrition (SAM)	25 392	25%	-	152 MT
Total	**37 419**		**-**	**318 MT**

Business Plan:

Factory production capacity	500 MT
Equipment cost	$800 000
Factory site costs	$500 000
Development of a new recipe	-
Miscellaneous	$260 000
Investment required	**$1 560 000**
Revenue from RUTF	$636 459
Revenue from RUSF	$419 453
Revenue	**$1 055 912**
Ingredient costs	$366 775
Packaging costs	$95 192
Labour costs (including training)	$26 440
Overhead costs	$250 000
Earnings before interest and taxes (EBIT)	**$317 505**
Pay-back period (assuming fixed volume and price)	*4,9 years*

In this scenario, local RUTF production is financially viable, and the investment pays back in 4.9 years.

8.2.6. SCENARIO 5: 4.6% OF SAM – 4.6% OF MAM – EXPORTS

Rationale:

- The producer produces RUTF & RUSF.
- The producer supplies UNICEF, WFP and AKDN.
- Their available funding aligns with recent budgets.
- The government does not allocate any additional funding.
- The producer manages to export RUTF to treat 5,000 cases outside of Tajikistan.

Hypotheses:

- % of SAM cases in Tajikistan treated with RUTF: 4.6%.
- % of MAM cases in Tajikistan treated with RUSF: 4.6%.
- 5,000 SAM cases treated in neighbouring countries.

Production volume:

Production volume:	Tajikistan		Outside of Tajikistan	Total
	# of cases treated	% of total	# of cases treated	Volume of RUTF/RUSF
Severe Acute Malnutrition (SAM)	2 213	4,6%	5 000	100 MT
Moderate Acute Malnutrition (SAM)	4 672	4,6%	-	28 MT
Total	**6 885**		**5 000**	**128 MT**

Business Plan:

Factory production capacity	250 MT
Equipment cost	$500 000
Factory site costs	$300 000
Development of a new recipe	-
Miscellaneous	$160 000
Investment required	**$960 000**
Revenue from RUTF	$381 691
Revenue from RUSF	$77 179
Revenue	**$458 870**
Ingredient costs	$146 987
Packaging costs	$38 970
Labour costs (including training)	$26 440
Overhead costs	$180 000
Earnings before interest and taxes (EBIT)	**$66 473**
Pay-back period (assuming fixed volume and price)	*14,4 years*

In this scenario, local RUTF production is financially viable, and the investment pays back in 14.4 years.

8.2.7. MAIN FINDINGS

To pay back the investment, the producer must produce at least 85MT of RUTF which would represent a complete treatment of 6,250 cases with RUTF (150 sachets per child) or 13% of the SAM burden in Tajikistan based on the hypotheses mentioned above.

Producing RUSF is less profitable than producing RUTF since RUSF cartons are less expensive ($53 vs $41) and use more resources (100g vs 92g per sachet). The price difference is primarily attributed to UNICEF being supplied from Europe, while WFP is supplied by Ismail Nutrition, based in Pakistan.

Producing RUTF and RUSF for international institutions in Tajikistan is not sufficient to pay back the investment (assuming they can dedicate the same budget, and that the government does not allocate any additional funding, as displayed in Scenario 3). This scenario, relying on local demand first, can only become profitable if the producer manages to export part of its production to other countries, or if the government agrees to double the total funding using a matching mechanism with UNICEF and WFP.

The business can be profitable if the volume of RUTF and RUSF becomes significant. Compared to other countries where ready-to-use foods are produced, Tajikistan benefits from lower labour costs and overall cheaper ingredients.

Important note: *This financial viability remains theoretical. As highlighted in other sections of the report, a major challenge to launching local RUTF production in Tajikistan will be to secure a commitment from the Government (or from any other donor) on volumes/prices of RUTF/RUSF purchases. Without this strict commitment that a stakeholder will buy the product for a certain duration, no stakeholder will be willing to enter into local RUTF/RUSF production, even if the project is theoretically financially viable.*

8.3. ENABLING ENVIRONMENT

Receiving support from the government is mandatory for the success of locally producing RUTF/RUSF. This support needed will be two-fold:

- **Support in establishing the business**: Creating a standard for RUTF, potentially providing assistance in finding a factory production site, accelerating the certification process, etc.
- **Agreement on purchasing RUTF/RUSF in the long run**: Due to the willingness of UNICEF and WFP to progressively step down and reduce their funding dedicated to RUTF and RUSF purchasing, the government will be the main client of a local producer. It is therefore necessary that the government commits to a purchasing price, purchasing volumes and in the long term, to convince a local producer to launch local production.

Based on the interviews conducted with public bodies and international institutions, the anticipated support from the government is limited, particularly regarding the budget that will be dedicated to these products in the coming years**.**

8.4. DESIRABILITY OF LOCAL PRODUCTION

8.4.1. MAIN CRITERIA OF DESIRABILITY

While local production is feasible in Tajikistan, several criteria must be considered to assess whether it would be more desirable than pursuing the status quo (importing RUTF/RUSF from abroad):

- **Price of products**: Since RUTF and RUSF markets are primarily driven by available budgets, reducing prices allows for a larger quantity to be purchased and a higher number of children to be treated.
- **Delivery time & costs**: Long delivery time increases the duration between budget availability and distribution on the ground. It also adds a risk in terms of the continuity of the supply. Higher delivery costs reduce the volume of RUTF/RUSF purchased. Since the onset of the conflict in Ukraine, products manufactured in Europe can no longer utilize the route through Russia to reach Tajikistan. Instead, they must now traverse the longer and more expensive

route through Turkey. As a result, the delivery time and costs have significantly increased, becoming a key challenge for UNICEF.

- **Investment**: Access to finance is a major challenge in Tajikistan.
- **Time:** Time before kickstarting production.
- **Local industry strengthening**: Reinforcing the local industry can lead to the creation of local jobs, access to foreign currency through exporting, and an increase in local industrial capacity to produce complex products.

The ban on palm oil imports has not been considered in this analysis, as several stakeholders reported that an exemption for RUTF was being negotiated and could become effective in the coming months.

8.4.2. IMPORTS VS LOCAL PRODUCTION

Tajikistan has the choice between continuing to import and starting local production of RUTF/RUSF:

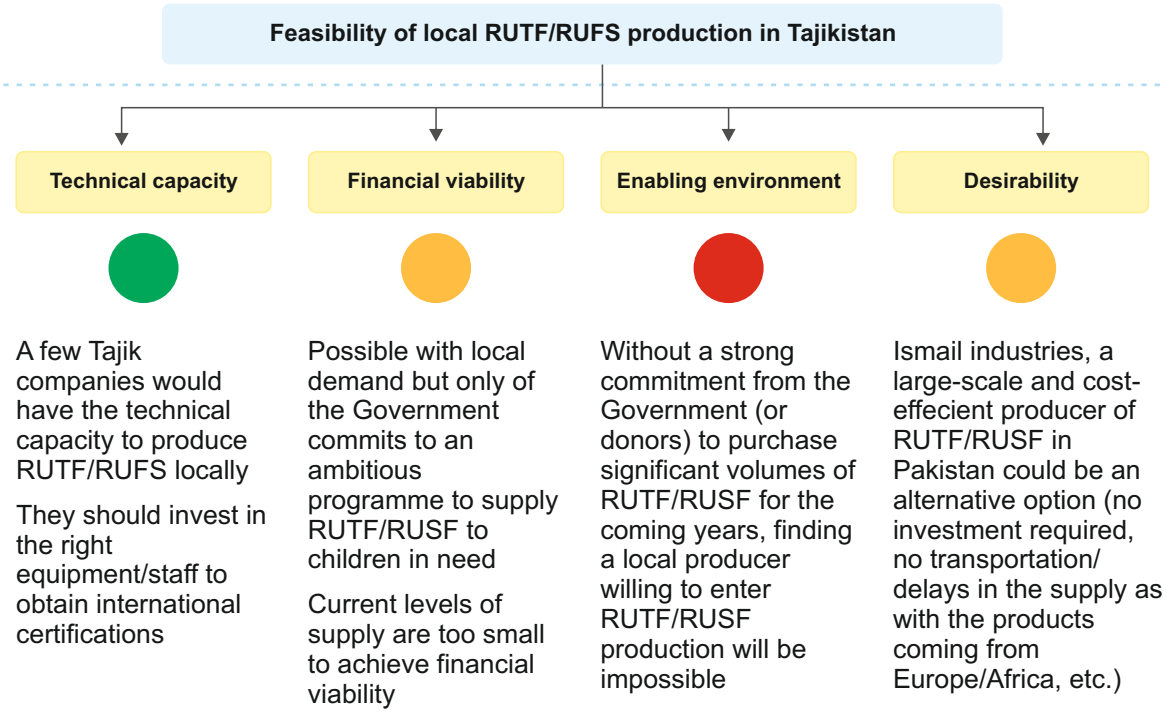
Criteria	Imports (current situation)	Local production
Prise of products	RUTF: $53 per carton RUSF: $41 per carton (Last prices paid by UNICEF&WFP)	Pricing strategy be defined but production costs anticipated to be lower than in most producing countries
Delivery costs & time	25-30% of products value One to two month	Limited delivery costs & time
Investment	No investment	From one to two million dollars, depending on production capacity and whether it's a brownfield or greenfield project
Timeline	Immediate production	Two years before starting production and obtaining UNICEF certification
Local industry strenghthening	No impact on the local industry	Development of local agricultural value chains, reinforcement of local capacity, potentially exports to neighboring countries

Producing RUTF/RUSF in Tajikistan is anticipated to be less expensive than importing, thanks to lower ingredient costs, the absence of long-distance delivery costs, and affordable labour. However, the initial investment will be significant and requires a lasting commitment from buyers to be desirable, especially if the factory is a greenfield project and needs certification from UNICEF and WFP. Other criteria, such as strengthening the local industry and reducing delivery time, may be prioritized over project costs by UNICEF, WFP, and the government.

9. CONCLUSIONS & RECOMMENDATIONS

9.1. CONCLUSIONS

Local RUTF/RUSF production is theoretically feasible in Tajikistan, both from a technical and financial perspective. However, and very importantly, it would re**quire a strong commitment from the Tajik government (or any other donor) on volumes and prices of purchase for at least a few years**. Without this commitment and given the limited opportunities outside of the local market, no producer (and no investor) will be willing to enter this complex business. Imports from Pakistan should be considered as an alternative option for the country. The diagram below presents the results of the feasibility assessment:



9.2. RECOMMENDATIONS

The conclusions drawn from this feasibility assessment are unequivocal.

Local production of RUTF/RUSF stands as a technically feasible and financially viable opportunity, contingent upon a robust commitment from the government or other donors to purchase the products from a local producer. Producing **85MT of RUTF** is deemed the minimum threshold for the business to be profitable without the production of RUSF. This would represent a complete

treatment of 6,250 SAM cases with RUTF (150 sachets per child) or 13% of the SAM cases in Tajikistan based on the hypotheses mentioned above.

To progress, UNICEF and its partners (e.g., WFP, USAID) must convince the government or donors of the critical nature of sustaining SAM/MAM treatment programmes in the country. Our recommendation to UNICEF and its partners is to focus efforts on advocacy initiatives aimed at encouraging the government to formulate a clear strategy for the future of SAM/MAM programmes in the country.

Once this strategy is established, the Excel tools developed as part of this research can be employed to assess the financial viability of local RUTF/RUSF production within the chosen framework.

If local production is deemed viable, subsequent steps (not detailed in this report) would involve agreeing on the volume, defining a recipe with the highest acceptability rate, and reaching out to Development Finance Institutions (DFIs) to secure funding, among other considerations. In the absence of local production in Tajikistan, considering the potential supply from the Pakistani producer Ismail Nutrition may present itself as an alternative option for the government and buyers.

Recommendation #1

Advocate for the exclusion of RUTF from the ban on palm oil products		
Who?	*Timeframe*	*Cost*
UNICEF	Short (<6 months)	No additional cost

Roadmap

1. Collect evidence on the effectiveness of RUTF in treating SAM, the effectiveness of the other treatment used, the current stock of RUTF in the country, and the number of children currently excluded from treatment.
2. Organize joint meetings with the MoHSPP and the Ministry of Industry to discuss RUTF exclusion from the ban on palm oil.
3. Follow up until the exclusion of RUTF from the ban on palm oil-based products.

Recommendation #2

Generate evidence on the current SAM and MAM caseloads in Tajikistan to address outdated sources, generate forecasting, and help create a compelling case for the continuation of RUTF/RUSF programmes, their takeover by the government, and the launch of local production

Who?	*Timeframe*	*Cost*
UNICEF, WFP, USAID, WHO, MoHSPP, Tajikstat	Medium (6 months – one year)	From $50,000 to $200,000 depending on coverage

Roadmap

1. Coordinate with WFP, USAID, WHO, the MoHSPP and Tajikstat to secure funding for organising a national survey on child malnutrition.
2. Present the key findings of the study to the MoHSPP and the Republican Paediatric Centre to ensure all the stakeholders share the same understanding of the situation regarding child malnutrition in Tajikistan.

Recommendation #3

Support the MoHSPP in the definition of a medium and long-term scaling-up plan detailing the government strategy to cope with SAM and MAM, in the context of decreasing international funding for these programmes

Who?	*Timeframe*	*Cost*
UNICEF, WFP, MoHSPP	Medium (6 months – one year)	Depending on the matching mechanism in place during the transition period

Roadmap

1. Organise joint meetings with the MoHSPP to raise awareness about the burden of SAM and MAM in Tajikistan, emphasizing that the available budgets from UNICEF and WFP for RUTF and RUSF will progressively decrease, due to a lack of donor support.
2. Discuss the opportunity to establish a financial partnership in which UNICEF and WFP contribute double the amount that the government allocates to the procurement of RUTF and RUSF (matching mechanism).
3. Ensure the inclusion of RUTF and RUSF in the country's medium/long-term health strategy.

Recommendation #4

Assess the potential willingness of local producers to start producing RUTF/RUSF in Tajikistan and define the support they will need for this initiative to be sustainable		
Who? UNICEF, WFP, Ministry of Industry	*Timeframe* Medium (6 months – one year)	*Cost* $50-100,000 worth of technical assistance

Roadmap

1. Organize follow-up meetings with the CEOs of Obi Zulol and Barakat Isfara to present them with the key findings of the study.
2. Listen to what would be necessary for them to start producing RUTF and RUSF (technical assistance needs).
3. Identify potential international stakeholders (UNICEF, WFP, USAID, etc.) who could provide and fund the required technical assistance needs of local producers.

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