Modeling a Cost-Benefit Analysis of the Integrated Resilience Programme in the Sahel
A site example

THE OVERALL VISION

Over a 5 years period, the integrated resilience programme aims to contribute to resilience building for food and nutrition security at scale. The programme ambitions to reach **5 million people** among the most vulnerable communities in the Sahel. Since 2018, the programme has already supported **4 million people across 5 countries**.

Using an integrated approach with a strong focus on resilience, social cohesion, social protection, and nutrition, the programme aims at:

1. improving food and nutrition security in the face of shocks and stressors
2. enhancing resilience capacities to face future shocks and stressors
3. creating an enabling environment to reduce humanitarian assistance, generate employmentand boost human capital.

INTEGRATED ACTIONS FOR RESILIENCE BUILDING

In a typical resilience site, WFP's integrated actions for resilience building within a community comprise five main components:

- Asset creation for land restoration and natural resources conservation
- Capacity strengthening
- Reduction of post-harvest losses and development of value chains
- Nutrition
- Home-grown school feeding programmes.

And mobilise complementary partnerships (ie. NGOs, UN,donors, governments, private sectors...).

MODELING A COST-BENEFIT ANALYSIS IN ONE INTEGRATED RESILIENCE SITE *

The example in the next pages illustrates the elements of WFP's intervention in a typical resilience site, showing how it builds resilience for food and nutrition security and helps the community to withstand shocks and crises. It also estimates the associated costs of the intervention

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* This example illustrates the typical resilience site across the Sahel region, considering that some variations are possible depending on the context. This example was developed using data from a WFP Cost-Benefit Analysis report, with initial estimates calculated at the household level. These data have been scaled-up to reflect the community level, encompassing approximately 300 households.

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compared to a traditional humanitarian intervention, and its associated benefits.

WFP's intervention in a typical Sahelian community is designed for a 5 years + 5 years period in the same community, including an average of 300 households with 7 members (ie. 2,100 people), aiming for a complete phase-out with resilient communities and ecosystems, strengthened government capacities, and a significant reduction in humanitarian needs.

1. WHAT ELEMENTS WFP'S RESILIENCE PACKAGE INCLUDES?

Asset creation for land restoration and natural resources conservation

Asset creation is a key element of WFP's interventions in a typical community. This includes:

- Sustainable land and water management activities resulting in **750 ha** of land rehabilitated and **1.9 million m³** of runoff water harvested.
- Productivity-boosting activities including **1-2 boreholes** with solar pumps and **4 ha** of community gardens.
- Interventions also involve improving infrastructures such as rehabilitating **10 km of feeder roads**, trails, and dikes.

Reducing PHL and development of value chains

- Interventions include training to approx. **300 households** on topics such as cooperative management, post-harvest loss management, commercialization.
- Rehabilitation of **1 warehouse**, including solar equipment for storage/transformation.

Capacity strengthening

Activities that build vocational capacity, sustainable land management practices, group formation and leadership skills (ie. youth and women), expand livelihood and income-generating activities, leveraging upon land restoration.

Nutrition

Activities to prevent and treat moderate acute malnutrition. On average **0,23 MT** of locally fortified/ improved food supplied to vulnerable agroups in an health center, promote **SBCC** and participation in nutrition education sessions in a **GASPA**.
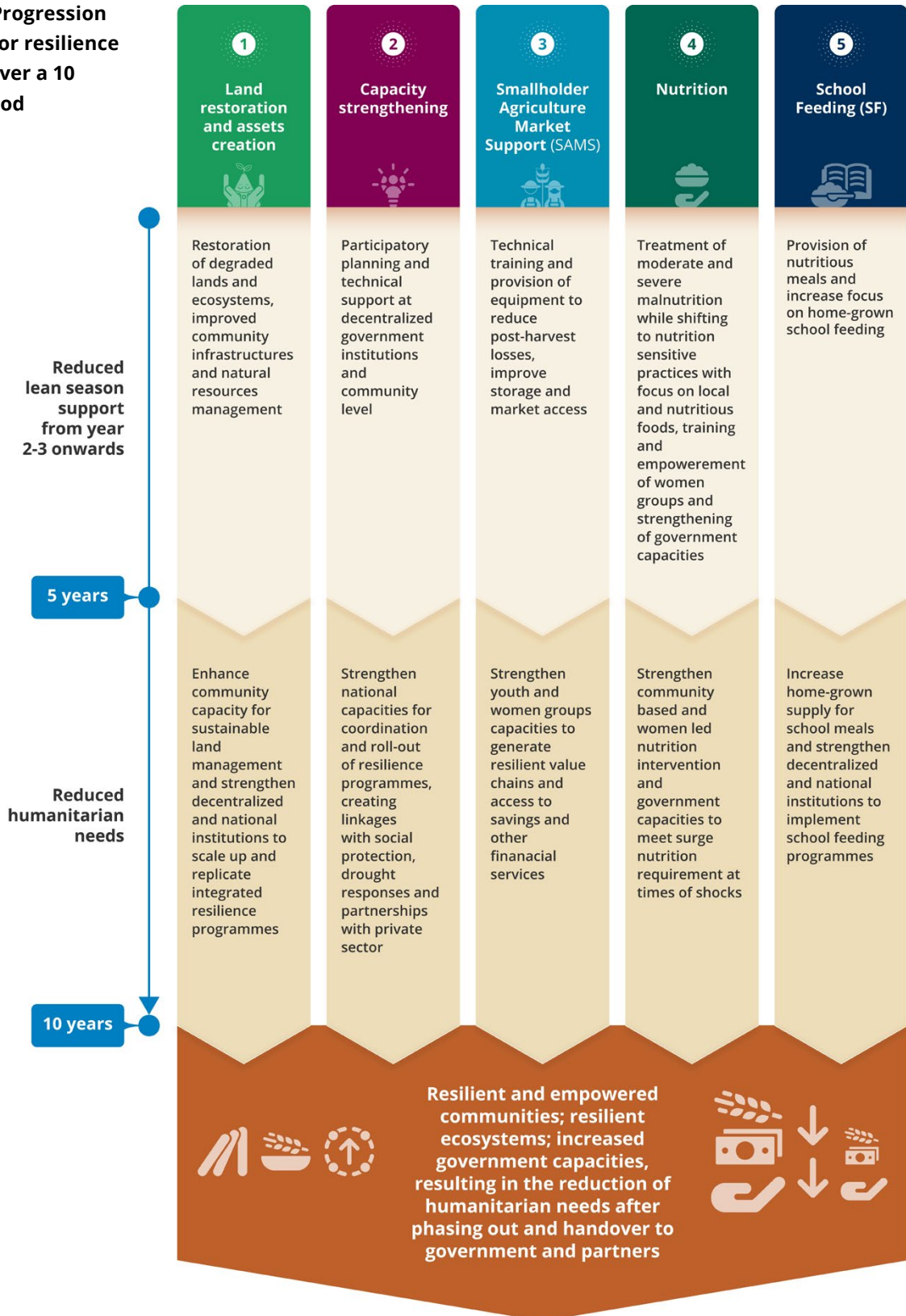
School feeding

Provide school meals to approx. **600 students**, using locally sourced foods from local farmers and school gardens to encourage fresh food and healthy eating habits. Rehabilitation of school kitchen/canteens including equipment such as fuel efficient stoves.

2. HOW IT BUILDS RESILIENCE?

Our intervention is designed for a 5 + 5 years investment period to completely the phase out with resilients communities and ecosystems, increased government capacities, resulting in the reduction of humanitarian needs.

Figure 1. Progression strategy for resilience building over a 10 years period

Reduced lean season support from year 2-3 onwards

5 years

Reduced humanitarian needs

10 years

1 Land restoration and assets creation	2 Capacity strengthening	3 Smallholder Agriculture Market Support (SAMS)	4 Nutrition	5 School Feeding (SF)
Restoration of degraded lands and ecosystems, improved community infrastructures and natural resources management	Participatory planning and technical support at decentralized government institutions and community level	Technical training and provision of equipment to reduce post-harvest losses, improve storage and market access	Treatment of moderate and severe malnutrition while shifting to nutrition sensitive practices with focus on local and nutritious foods, training and empowerement of women groups and strengthening of government capacities	Provision of nutritious meals and increase focus on home-grown school feeding
Enhance community capacity for sustainable land management and strengthen decentralized and national institutions to scale up and replicate integrated resilience programmes	Strengthen national capacities for coordination and roll-out of resilience programmes, creating linkages with social protection, drought responses and partnerships with private sector	Strengthen youth and women groups capacities to generate resilient value chains and access to savings and other finanacial services	Strengthen community based and women led nutrition intervention and government capacities to meet surge nutrition requirement at times of shocks	Increase home-grown supply for school meals and strengthen decentralized and national institutions to implement school feeding programmes

Resilient and empowered communities; resilient ecosystems; increased government capacities, resulting in the reduction of humanitarian needs after phasing out and handover to government and partners

3. WHAT ARE THE COSTS OF THE RESILIENCE PACKAGE COMPARED TO THE COST OF HUMANITARIAN ASSISTANCE FOR 1 MODEL VILLAGE WITH 300HHS DURING...

A HUMANITARIAN ASSISTANCE COST

B ASSOCIATED LOSSES

C RESILIENCE PACKAGE COST

D ESTIMATED BENEFITS FROM THE INTERVENTION

... 5 YEARS?

A Lean season and major shocks support + nutritional / treatments

Total: 1,290,000 USD

B
- **Environmental costs:** fertility replacement and other environment services
- **Social and Incomes Losses:** medical expenditures, drop-out and human capital losses

Total: 1,125,000 USD

E = A+B: **2,415,000 USD**

C Total investment needed

Total: 1,050,000 USD

D
- Increased yealds and carbon sequestration from rehabilitated land
- Reduced post-harvest losses and reduction of hardship
- Access to vegetable and health improvement
- Human capital and reduction of debt burden

Total D: 2,565,000 USD

Total D': 2,339,400 USD[1]

E' SAVED COSTS OF HUMANITARIAN ASSISTANCE AND LOSSES

Assuming resilience interventions reduce the need for humanitarian assistance by 75% on average, E'= E * 75%

E' 1,811,250 USD

Net benefit of a resilience intervention

$$= (D' + E') - C$$

3,100,650 USD

BENEFIT–COST RATIO AFTER 5 YEARS $= \dfrac{(D' + E') - C}{C} * 100$

Considering the saved costs of humanitarian assistance and the benefits of resilience investment, the benefit-cost ration of resilience investment **after 5 years** is **295%**

FOR **USD 1** INVESTED IN **RESILIENCE**

THERE IS A RETURN OF APPROX. **USD 3** IN **BENEFITS AND SAVINGS**

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1 Total Estimated benefit applying high-risk discount rate (3.9% rate) over 5 years

To calculate the cost-benefit ratio of resilience intervention over 10 years, we need to extend the previous 5-years analysis with the given assumptions:

- Humanitarian assistance costs remain unchanged from year 6 to 10. Under this assumption, **e=a+b = 4,830,000 USD**

- Cost of resilience investment reduces to 50% of the yearly cost on average from year 6 to 10. **c = 1,575,000 USD**

- The benefits from resilience investments continue from year 6 to year 10, with a gradual reduction due to the applied discount rate related to long-term investment in high-risk contexts. **d = 6,083,400 USD & d' = 5,073,000 USD[2]**

- The return from human capital (drop-out reduction) remains unchanged as in year 5 calculation.

Assuming resilience interventions reduce the need for humanitarian assistance by 75% on average, E'= E * 75%

e' **3,622,500 USD**

Net benefit of a resilience intervention

7,120,500 USD

= (d' + e') - c

$$\text{BENEFIT–COST RATIO AFTER 5 YEARS} = \frac{(d' + e') - c}{c} * 100$$

Considering the saved costs of humanitarian assistance and the benefits of resilience investment, the benefit-cost ration of resilience investment **after 10 years** is **452%**

FOR USD 1 INVESTED IN RESILIENCE

THERE IS A RETURN OF APPROX. USD 4.5 IN BENEFITS AND SAVINGS

2   Total Estimated benefits applying high-risk discount rate (3.9% rate) over 10 years

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