Value Links

for

Agrifood Systems

Module 4

Green & social business models

ValueLinks for Agrifood Systems

Framework	Analysis & Strategy	Transformative Actions Menu	
1 Scope of transformation	2 Agrifood system analysis	**4 Green & social business models**	7 Financing and insurance
	3 Transformative strategy	5 Reliable & fair business linkages	8 Nutritious food and standards
		6 Services for innovation	9 Policies for AFS transformation

Module 4 Green & social business models

01 **Business Model Canvas**

02 Economic & financial analysis

03 Green and social business models in practice

Business models and the Agrifood system

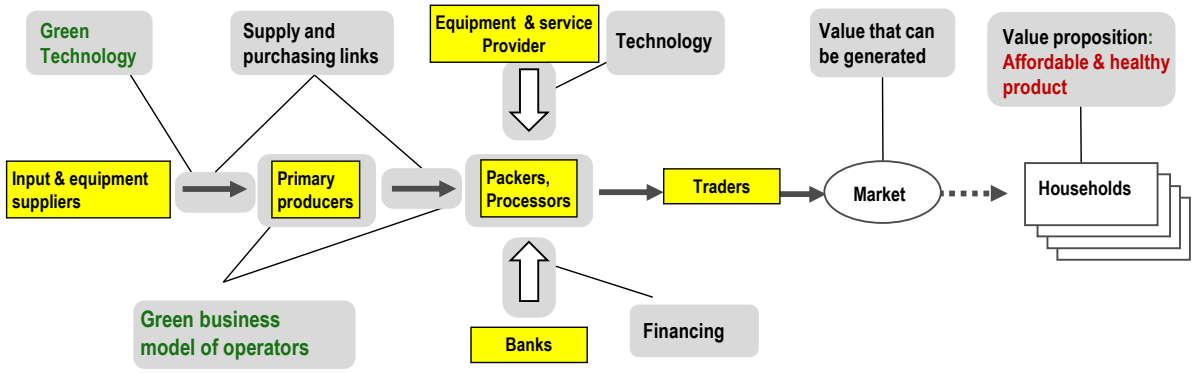
Every enterprise has a business model, either implicitly or explicitly.

The AFS as a whole can be divided into specific types of AFS actors with similar business models.

Definition: A business model is…

… a specific combination of product/markets, internal operations & technology, supply and marketing links that an enterprise uses to succeed and grow (Wikipedia: "the rationale of how an individual firm creates, captures and delivers value")

Food value chains consist of different business models



Business model canvas

Key Partners
Key suppliers?
Other partners?
Which key resources do we acquire from partners?
Which key activities do partners perform?

Key Activities
… that are required by value propositions, relationships, distribution channels, revenue streams

Key Resources
What key resources do value propositions, relationships, distribution channels, revenue streams require?

Value Propositions
What value do we deliver?
Which of our customer´s problems are we helping to solve?
What bundles of products and services are offered?
Which customer needs are we satisfying?

Customer Relationships
What types of relationships with each customer?
Are they integrated with the business model?
How costly are they?

Channels
… through which customers are reached?
Are channels integrated?
Which ones work best, are most cost-efficient?

Customer Segments
For whom are we creating value?
Who are the most important customers?

Cost Structure
Which key resources are most expensive?
What are the most important costs inherent in the business model?
Which key activities are most expensive?

Revenue Streams
For what value are customers willing to pay?
For what do they currently pay?
How much does each revenue stream contribute to overall revenues?

Strengthen your and your clients' skills >> e-learning course on Business Model Canvas at Atingi.org

How can we use the business model canvas approach?

- Help **improving existing business models**
- Generate **new business ideas** to create jobs and market access
- **Introduce technical innovations** based on a holistic economic assessment
- **Support the replication** of improved business models
- Ensure that **financially attractive solutions suggested** for VC development (such as linkages, service provision, financing) are
- For communication with financial partners to **raise funds**

Business models for agrifood systems transformation

… always build on a **technical and organizational innovation**
to reduce losses, emissions & pollution, protect biodiversity, save resources
(e.g. water saved, soils protected
to provide affordable, healthy & nutritious food

For success **Economic viability** of such innovations must be secured

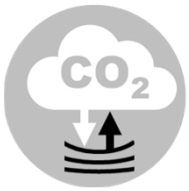
Conventional business models turned green & climate smart
e.g. increased energy efficient production, rainwater harvesting

Start-up (new) business models
e.g. urban gardening, protein from insect production, indoor vegetable production, recyclable packaging, carbon sequestration, resource-efficient equipment

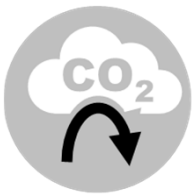
Service business models for the green economy
Life cycle analysis (LCA) and footprint calculation, nutrition advice, technical consulting

Climate change and business strategies in a nutshell

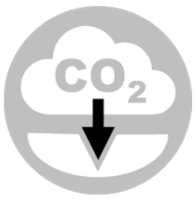
Build resilience by adaptation



Reduce your emissions



Capture & store emissions



Business model: Commercial products or services

+

Business model: Data on emissions reduced or captured in core business

Conditions, limits and risks

- **Business model development and financial analysis are always prone to error** – even if all required standard tools have been deployed properly.
- **The decision to invest and the risk are taken over by entrepreneurs** – not by analysts.
- **Business outsiders often do not have access to the requisite data.**
- Unless enterprises, professional organizations and companies request collaboration with development agencies and a **trusting partnership** is created, external agencies cannot go for supporting business models.
- **Analysts should not spread business secrets** that individual enterprises need to stay competitive.
- There are **limits to replicating interesting business models** because of limited market demand and decreasing product prices in end markets.

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Analysis of business models

Step 1 Business model canvas

Structured and descriptive analysis of value proposition incl. some financial and technical parameters and main criteria (technology, cost, prices, marketing etc.) to judge whether the business model may seem viable in general

Step 2 Profitability analysis before financing

- Analysis of the key parameters of the business model (e.g. production factors needs & use)
- Cash flow analysis break-even estimate, productivities of production factors; Net Present Value, Internal rate of return, benchmarking

Step 3 Financial viability of the investment

- Cash flow round 2 incl. disbursements, reimbursements and effective cost of external capital;
- Responsibility of the entrepreneur him-/herself potentially with support from financial institutions or incubators, 2nd round NPV, IRR, benchmarking

Cash flow to analyse business models' profitability over time

Cost Structure

- **Liquidity for operations & investment per year**
- **Working capital** in year 1: 1.496 million

Revenue streams per year

Balances

- **Annual balance**
- **Cumulative balance** at constant prices

Cash flow period					
Year	*1*	*2*	*3*	*4*	*5*
1. Outflows	**1,696**	**755**	**1,568**	**755**	**1,468**
Equipment and infrastructure	***200***		***100***		
Inputs and services	***1,254***	***603***	***1,226***	***603***	***1,226***
Potato	*986*		*974*		*974*
Groundnut	*258*		*242*		*242*
Onion		*593*		*593*	
Maintenance Irrigation	*10*	*10*	*10*	*10*	*10*
Labour	***242***	***152***	***242***	***152***	***242***
Potato	*171*		*171*		*171*
Groundnut	*71*		*71*		*71*
Onion		*152*		*152*	
2. Inflows	**2,140**	**1,470**	**2,140**	**1,470**	**2,140**
Potato (40 tons/ minipivot)	1,360		1,360		1,360
Groundnut (3 tons/ minipivot)	780		780		780
Onion (70 tons / minipivot)		1,470		1,470	
3. Annual balance	**444**	**715**	**572**	**715**	**672**
4. Cumulative balance	**444**	**1,159**	**1,731**	**2,446**	**3,118**

Case from Algeria All in constant thousands DZD; 161 DZD = 1 EUR

Assessing profitability and competitiveness of investments

Payback period (PBP)

- How long does it take to recover the investment and related costs.
- Is the **year in which the cumulative cash flow becomes positive**.
- Does not consider benefits and costs after PBP

Short PBP is good particularly for start-up investments.

Net Present Value (NPV)

- Measures the **absolute return on investment**
- Can be **compared** with other investment options
- Chosen discount rate might be disputable. Changing it might reverse the order of projects compared in terms of NPV

NPV is greater than 0 the investment is acceptable.

Internal Rate of Return (IRR)

- **The IRR is the discount rate at which NPV is 0.**
- IRR measures the **efficiency** of an investment.
- The investment is viable if **IRR is greater than the discount rate used to calculate NPV.**

IRR higher than discount rate used for NPV is …what bankers are looking for.

Comparing transformative investments & business models (1)

	Cashew rehabilitation & food crops	Drip irrigation & crop rotation	Aquaculture with Tilapia
Advantages	Food crops buffer foregone cashew revenue (yr 1 to 3) Technique rejuvenates trees less expensive than replanting → Soil & water protected → GHG captured	Rotational food crops provide more income than monoculture Better water infiltration Groundnut fixes nitrogen	Creates jobs Provides protein More income as integrated with crop production
Land size used	1 hectare	1 hectare	1 hectare (50 ponds @200sqm)
Investment's economic life	22 years	5 years	15 years
Cashflow period	22 years	22 years	22 years
Cycles in comparison	1 cycle	4.5 cycles	1.5 cycles

Comparing transformative investments & business models (2)

		Cashew rehabilitation & food crops 3 yrs.	Drip irrigation & crop rotation	Aquaculture with Tilapia; 50 ponds
	Investment capital in year 1	**76 €**	**1,242 €**	**17,058 €**
	Working capital in year 1	**561 €**	**9,292 €**	**7,356 €**
	Annual balance negative	None	None	Year 1
Over 22 years	**Cumulative balance**	**10,229 €**	**84,665 €**	**131,876 €**
Over 22 years	**Payback Period** (PBP)	1 year	1 year	3 years
Over 22 years	**Net Present Value** (NPV) @0.05 discount rate	**5,775 €**	**50,427 €**	**73,584 €**
Over 22 years	**Internal Rate of Return** (IRR)	Infinite*	Infinite*	73%

*infinite means that the IRR cannot be calculated if the annual balance in year 1 is positive

Assessing investment's risks & sensitivity: Switching Value (SV)

Parameter	Initial parameter value	Parameter value at which NPV = 0	Switching Value
↓ **Yield** (kg Fish / pond)	100	63	**-37%**
↓ **Sales price** (MWK/kg)	2,750	1,744	**-37%**
↑ **Investment cost** (MWK)	320,000	1,416,000	**343%**
↑ **Labour cost** (MWK)	38,000	138,600	**265%**
↑ **Input & service cost** (MWK)	100,000	201,000	**101%**

Percentage change of cost / revenue parameters at which NPV = 0

NPV = 0
you leave the zone of profit

…every further decrease of revenue parameters respectively increase of cost parameters worsens the situation.

The smaller the span of SV, the more risky the investment may be.

Tool: Cash flow
Process: You decrease yield / sales price until NPV = 0
Your increase cost parameters until NPV = 0

Hedge against risk **or** **Abandon investment**

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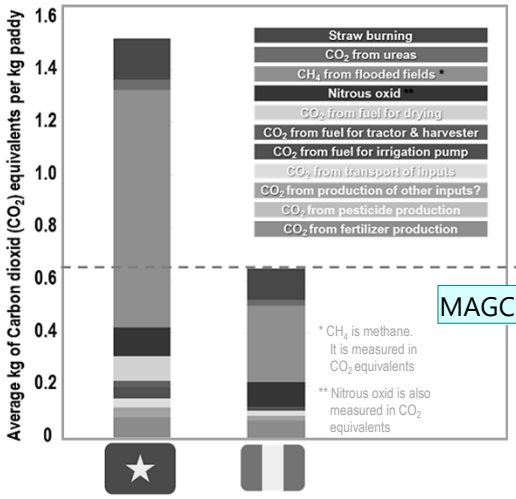
Climate-smart(er) rice from Nigeria



Compared to rice from Vietnam, rice in Nigeria is produced with 50% less GHG

MAGC30 ifference mainly due to ultiple drainage or rainfed rice production at low methane emissions in Nigeria

Further mitigation options

- Produce briquets from rice
- with solar powered briquet presses
- Straw for feed

➔ **Lower emissions and less impact for climate change**

➔ **Generating employment and incomes for Nigerians**

Source: CARI. 2021. Screening LCA of the rice and cashew value

A cooperative climate-smart business model from Vietnam

Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
09 cooperative members, particularly minority women with traditional farming methods; **50 mango farmers applying GAP practices** **Local extension workers for FFS training on VietGAP;** **Experts from Fruit Research Institute; GIZ**	Production & sales of fresh fruit **Production and sales of dried fruits, avoiding food losses**	Sales of fresh fruit (mango, longan, …) **High quality, food safety-certified, solar-dried fruit (banana, ginger, longan, mango) with environmentally-friendly packaging**	Informal linkages with local collectors, no linkages with exporters **Promote brand identity, repeat sales and formal contracts**	90% local market, 10% Chinese market **Specialty shops, high value urban markets, tourist markets in Vietnam.**
	Key Resources Personnel Factory and storage **Solar drying dome** **Employing unskilled labour**		**Channels** Direct sales to local collectors. **Online marketing via Facebook/social media, conferences, trade fairs**	

Cost Structure

Investment in storage facilities and short-term capital for trading fresh fruit

Investment in factory building and solar drying dome, cost of packaging material, food hygiene and safety certification cost

Revenue Streams

Margins from seasonal sales of fresh fruit

Year-round sales of high value, processed and certified green products

MAGC30 Methane emissions are influenced by the water regime and local climate conditions.

About 85% of rice in Vietnam is irrigated, and 83% of these rice fields is characterised by continuous
flooding and single drainage, which contribute to higher CH4 emissions.
Matthess, Annemarie GIZ CM; 26.06.2023

Cocoa biomass waste to wealth: cooperative business model, Côte d'Ivoire

Côte d'Ivoire Cocoa: Over 10 million tons biomass wasted per year

Manual pod breaking & fermentation / drying at MSME level

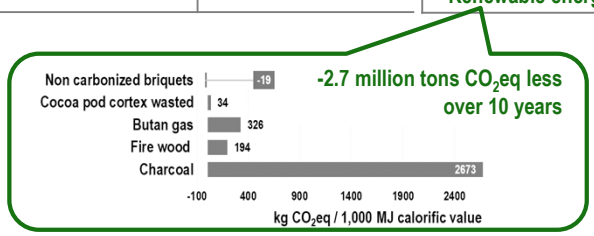
Source: Based on Green Innovation Centre and Agri-Business Facility for Africa. 2023. Design basis for Processor Business School (PBS). Côte d'Ivoire

Biomasses - Energy Content when Used as Fuel (engineeringtoolbox.com)

Video on the model. ABF

Cash flow analysis enlarged

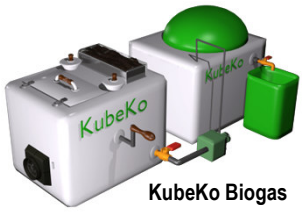
	Bean sales only cooperative sells 560 mt p.a. for 300 members @ Coop 10 years	**Briquets** from 2,661 tons p.a. dried pod residues @ Coop 10 years	**Mushrooms** dried from pod residues @ 300 MSME 10 years
Cumulative cost inputs, labor, services, investments	170,730 €	273,845 €	2,304,000 €
Cumulative revenue	512,195 €	2,697,629 €	8,505,000 €
Cumulative balance	**341,465 €**	**2,423,784 €**	**6,201,000 €**
Pay-Back Period	Year 1	Year 2	Year 1
Employment	1 full time / year	**6 full time / year**	**106 full time** eq / year
Providing		**142,813 GJ Renewable energy**	**240,000 kg Protein**



-2.7 million tons CO_2eq less over 10 years

Climate smart processor business models

- Processing close to primary production
  → Shorter transport distance, less transport volume
- Green energy / energy saving processing technology
- ↑ Water efficiency ← water storage & recycling
- Ecological packaging material
- Processing of by-products
- No harmful / poisonous / polluting substances
- Re-location of processing industries (e.g. flood-safe)



KubeKo Biogas

LONO
Côte d'Ivoire
https://www.lonoci.com

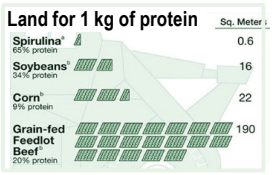
➔ **Less losses and waste by recycling**

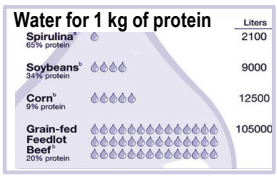
➔ **More and better food**

➔ **Benefit from environmental standards & labels**

Business models for better nutrition, Chad

Women groups in Chad process *Spirulina microalgae*





Spirulinasource.com: Why Spirulina?

Fortified flour production for child nutrition in Chad

- Maize flour + beans, peanuts, minerals and vitamins
- Produced by 4 SME's under joint trademark MANISA
- Targeting private households via retailers