Food and Agriculture Organization of the United Nations

EX-ACT for Value Chain

Official Launch

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Photo credit: Atul Loke for FAO

OUTLINE

01 **Context of agri-food VC**

02 **Tool objectives**

03 **The old & new**

04 **Limitations**

05 **How the tool looks**

01
CONTEXT

CONTEXT: Why assess Agri-food Value Chains

Substantial **environmental** impact

Great **socioeconomic** relevance

About **21-37%** of total **greenhouse gas (GHG) emissions** are attributable to the food system

40-50% of farmers are **subsistence farmers** and disconnected from the market

Identify opportunities to improve current VCs

Leverage for a large impact

Source: IPCC, 2019; Seville, D. 2011

02
TOOL OBJECTIVES

OBJECTIVES of EX-ACT VC

The overall objective of EX-ACT VC is to provide a holistic assessment of agri-food value chains projects by:

Assessing the **environmental** impact

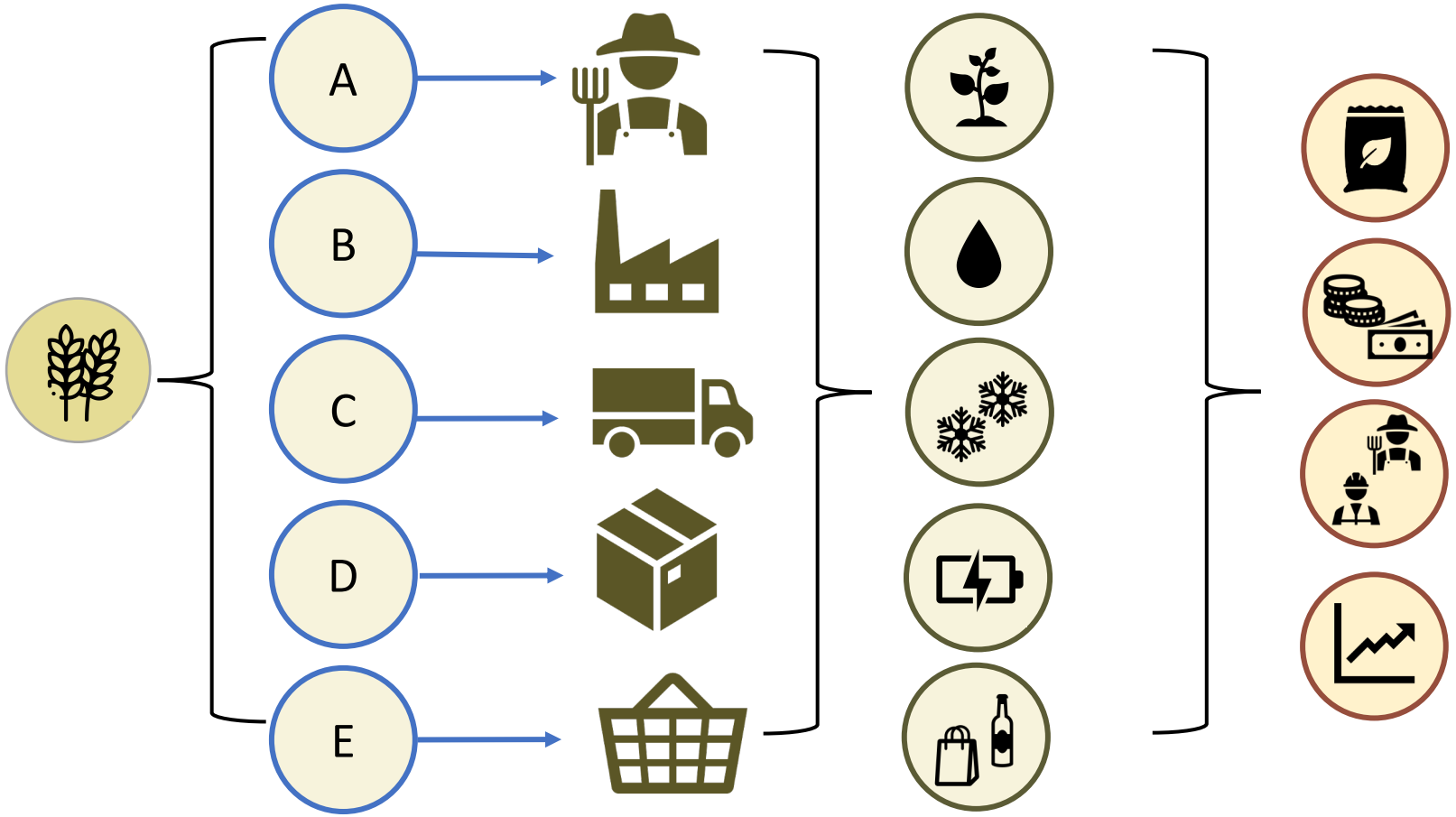
Assessing the **economic** impacts

Assessing the **societal** impacts

03

THE OLD & NEW TOOL

APPROACH OF EX-ACT VC v.2.4 (Old V.)



REVISION OF EX-ACT VC (v.3.0) – 2020

NEW

The revision of the EX-ACT VC aimed to provide a tool that could be more:

Flexible

Allowing users to map their unique VC, by asking them to identify different groups of actors performing various activities.

Comprehensive

Allocating environmental and socio-economic results, both by category of actor and type of activity, some of which are then linked to specific SDG indicators.

Direct

Sharing the “commodity tracker” with users provides an easier means to double check assumptions and the resulting flow of commodity throughout the VC.

THE CHANGES

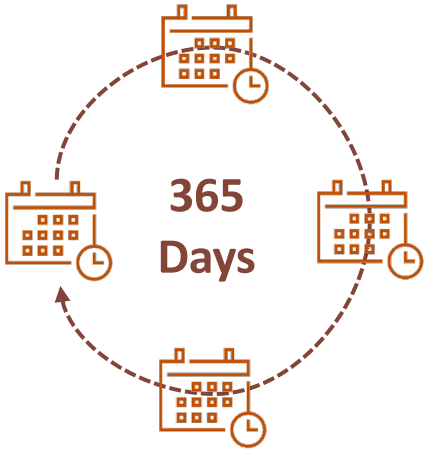
Revised Methodology	New GHG Emission Factors
• Wastewater (IPCC, 2019 refinement) • Storage (GWP of refrigerants included) • Socio-Economic (optional inclusion of fixed capital costs)	• Transportation • Energy

Included Modules	Removed Modules
• Commodity Tracker • Quantitative Gender & Youth assessment • Sustainable Development Goals Tracker	• Qualitative System Resiliency assessment • Calculation of land-based emissions

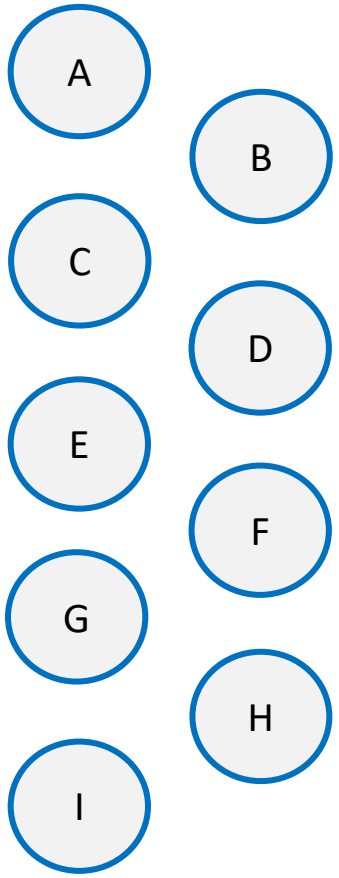
NEW

SCOPE of EX-ACT VC v.3.0

Five categories of commodities

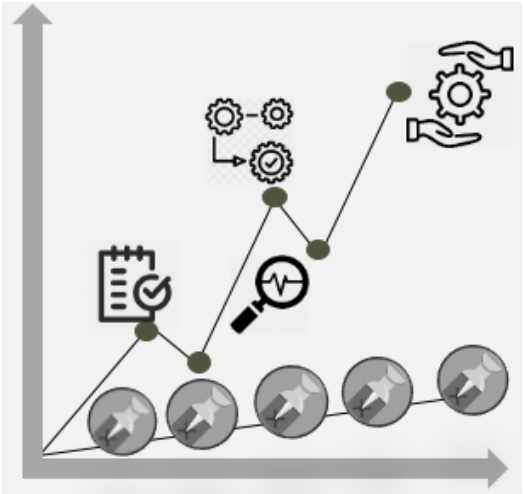


Annual snapshot of the value chain



Up to nine unique categories of actors

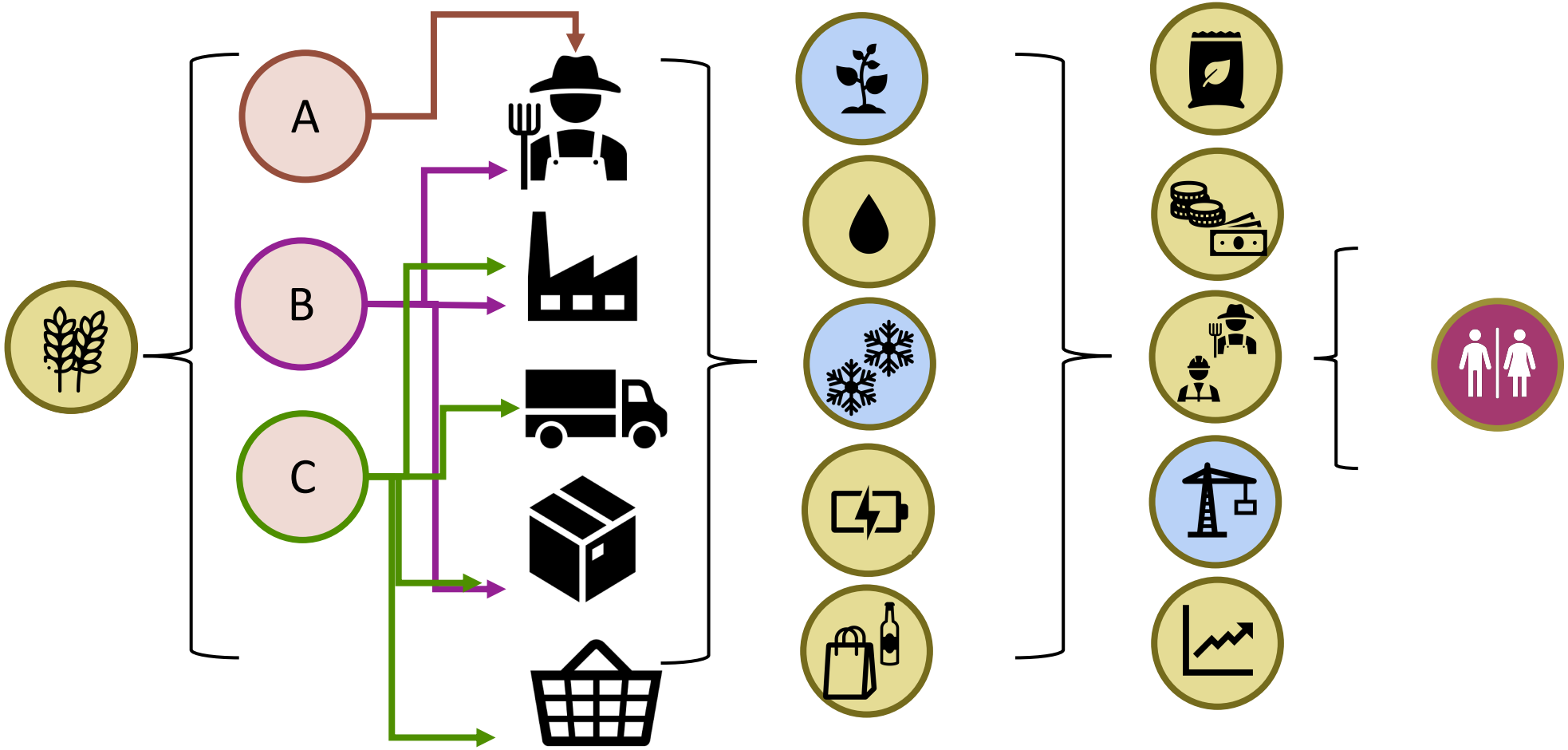
Five possible activities for each category of actor



Current scenario vs. planned scenario

APPROACH OF EX-ACT VC v.3.0

NEW

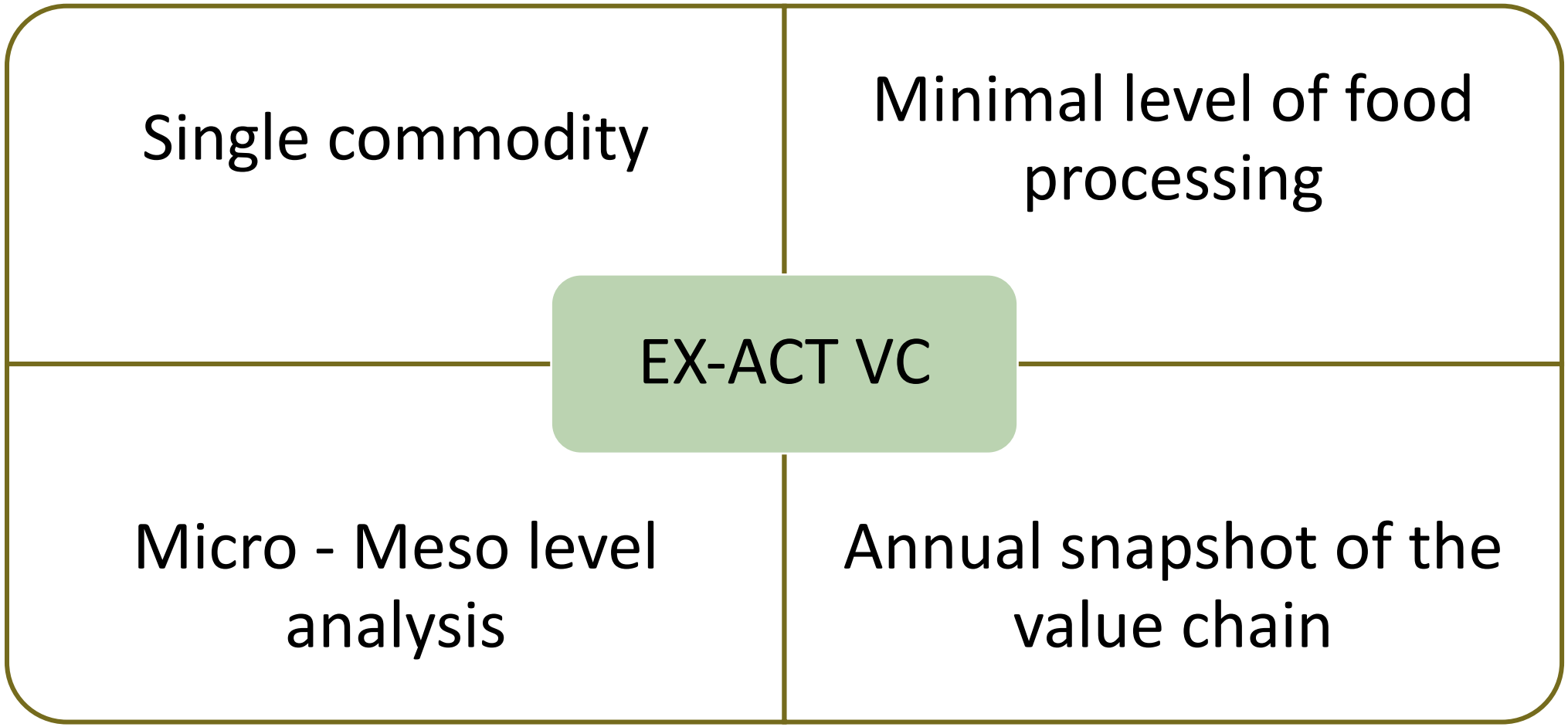


Commodity | Categories of actors | Activities | Activity Data GHG | Activity Data Economic | Women & Youth labour participation

05
LIMITATIONS

LIMITATIONS OF EX-ACT VC v.3.0

NEW



06
HOW THE TOOL LOOKS

START OF EX-ACT VC v.3.0

Food and Agriculture Organization of the United Nations

EX-ACT VC Version 3.0

Start | Commodity tracker | Off-farm GHG assessment | Socio-economic assessment | Results

Step 1 - Description of Project

User Name	Test User
Date	12/01/21
Project Name	Project Name
Project Code	NA
Project Budget (USD)	NA
Funding Agency	NA
Implementing Agency	NA
Project Status	Please select

EX-ACT VC

EX-ANTE CARBON-BALANCE TOOL FOR VALUE CHAIN ANALYSIS

Step 2 - Description of Value Chain

Value Chain Commodity		Perennial Crop
Type of Value Chain		Global value chain
Location of Value Chain:	Continent	Eastern Africa
	Country	Kenya
	Region / Municipality	Coast
Exchange rate (USD / local currency)	1 USD =	109 KES

Global Warming Potential 100-year	
Fifth Assessment Report (AR5)	
CO2	1
CH4	34
N2O	298

Step 3 - Mapping out the Value Chain

Category of Actor	Please Name Category	Please Describe Category	Number of Actors within Category: Current	Number of Actors within Category: Planned	Describe Commodity Sold	Purchases Commodity From: Current	Purchases Commodity From: Planned	Sells Commodity To: Current	Sells Commodity To: Planned	Please identify activities performed (either current or planned): Primary Production	Storage (Pre-Processing)	Processing	Water Used (Processing)	Packaging	Storage/Display	Transportation: Pick Up	Transportation: Delivery	Is the commodity at retail?	Location of Category of Actor: Country	Exchange rate (1 USD = ___)	Local Currency
Example:	*Small Scale Producers*	*Small-scale vegetable growers*	20	30	*Fresh Tomatoes*			*Local Coop*		*Yes*	*Yes*	*No*	*Yes*	*No*	*No*	*N.A*	*Yes*				
Actor[s] A:	Small-scale producer (HH)		1000	1000	Mango	Not Applicable	Not Applicable	Other Actor	cb-cooperative	Yes	No	No	No	Yes	No	No	No	No	Kenya	109	KES
Actor[s] B:	Medium-scale producer (HH)		50	50	Mango	Not Applicable	Not Applicable	Other Actor	men driven cooperat	Yes	Yes	No	No	Yes	No	No	Yes	No	Kenya	109	KES
Actor[s] C:	C		0	0		Please select	Please select	Please select	Please select	Yes	Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select		Please select
Actor[s] D:	women driven cooperative		1	2	Dry mango	Other Actor	m-scale producer	Other Actor	Other Actor		Yes	Yes	No	Yes	Yes	Yes	No	No	Kenya	109	KES
Actor[s] E:	CB-cooperative	a community based cooperative	2	4	Dry mango	Other Actor	ll-scale producer (H	Other Actor	Please select		Yes	Yes	No	Yes	Yes	Yes	Yes	No	Kenya	109	KES
Actor[s] F:	Europe warehouse		0	0		Other Actor	Please select	Please select	Please select		Please select	Please select	Please select	Yes	Yes	Yes	Yes	Yes	Italy	0.82	EUR
Actor[s] G:	G		0	0		Please select	Please select	Please select	Please select		Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select		Please select
Actor[s] H:	H		0	0		Please select	Please select	Please select	Please select		Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select		Please select
Actor[s] I:	I		0	0		Please select	Please select	Please select	Please select		Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select	Please select		Please select

STEP 4 - Description of On-Farm Activities

		Small-scale producer (HH)			Medium-scale producer (HH)			C		
For the SDG Tracker, can this category of actor be defined as "small-scale"?		Yes			No			Yes		
		Current	Planned		Current	Planned		Current	Planned	
Value-Chain (Meso) Level Data	Total Amount Harvested			Tonnes			Tonnes			Tonnes
	Total Land used for Production			Ha			Ha			Ha
	Average Yield			Tonnes/Ha			Tonnes/Ha			Tonnes/Ha
	Total Emissions Associated with Production			tCO_2e / yr			tCO_2e / yr			tCO_2e / yr
Individual (Micro) Level Data	Total Amount Harvested	0.0	0.0	Tonnes	0.0	0.0	Tonnes	0.0	0.0	Tonnes
	Total Land used for Production	0.0	0.0	Ha	0.0	0.0	Ha	0.0	0.0	Ha

START OF EX-ACT VC v.3.0

Step 1 - Description of Project

User Name	Test User
Date	12/01/21
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Step 2 - Description of Value Chain

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Type of Value Chain		Global value chain	
Location of Value Chain:	Continent	Eastern Africa	
	Country	Kenya	
	Region / Municipality	Coast	
Exchange rate (USD / local currency)	1 USD =	109	KES

EX-ACT VC

EX-ANTE CARBON-BALANCE TOOL
FOR
VALUE CHAIN ANALYSIS

Click for Instructions

Second Assessment Report (SAR)
Fourth Assessment Report (AR4)
Fifth Assessment Report (AR5)

Global Warming Potential 100-year	
Fifth Assessment Report (AR5)	
CO2	1
CH4	34
N2O	298

MAPPING OF VC IN EX-ACT VC v.3.0

Give a name to the actor that does not necessary link it to only one activity

# of actors participating
Type of commodity
To whom it sells

Identify all the activities that the actor performs in the value chain

Step 3 - Mapping out the Value Chain

	Category of Actor	Please Name Category	Please Describe Category	Number of Actors within Category		Describe Commodity Sold	Purchases Commodity From:		Sells Commodity To:	
				Current	Planned		Current	Planned	Current	Planned
	Example:	*Small Scale Producers*	*Small-scale vegetable growers*	*20*	*30*	*Fresh Tomatoes*			*Local Coop*	
	Actor(s) A:	Small-scale producer (HH)		1000	1000	Mango	Not Applicable	Not Applicable	Other Actor	cb-cooperative
	Actor(s) B:	Medium-scale producer (HH)		60	60	Mango	Not Applicable	Not Applicable	Other Actor	men driven cooperat
	Actor(s) C:	C		0	0		Please select	Please select	Please select	Please select
	Actor(s) D:	women driven cooperative		1	2	Dry mango	Other Actor	dium-scale producer (	Other Actor	Other Actor
	Actor(s) E:	CB-cooperative	a community-based cooperative	2	4	Dry mango	Other Actor	nall-scale producer (H	Other Actor	Please select
	Actor(s) F:	Europe warehouse		0	0		Other Actor	Please select	Please select	Please select
	Actor(s) G:	G		0	0		Please select	Please select	Please select	Please select
	Actor(s) H:	H		0	0		Please select	Please select	Please select	Please select
	Actor(s) I:	I		0	0		Please select	Please select	Please select	Please select

Please identify activities performed (either current or planned)

Primary Production	Storage (Pre-Processing)	Processing	Water Used (Processing)	Packaging	Storage/Display	Transportation: Pick Up	Transportation: Delivery
Yes	*Yes*	*No*	*Yes*	*No*	*No*	*N.A*	*Yes*
Yes	No	No	No	Yes	No	No	No
Yes	Yes	No	No	Yes	No	No	Yes
Yes	Please select	Please select	Please select	Please select	Please select	Please select	Please select
	Yes	Yes	No	Yes	Yes	Yes	No
	Yes	Yes	No	Yes	Yes	Yes	Yes
	Please select	Please select	Please select	Yes	Yes	Yes	Yes
	Please select	Please select	Please select	Please select	Please select	Please select	Please select
	Please select	Please select	Please select	Please select	Please select	Please select	Please select
	Please select	Please select	Please select	Please select	Please select	Please select	Please select

MAPPING OF VC IN EX-ACT VC v.3.0

STEP 4 - Description of On-Farm Activities

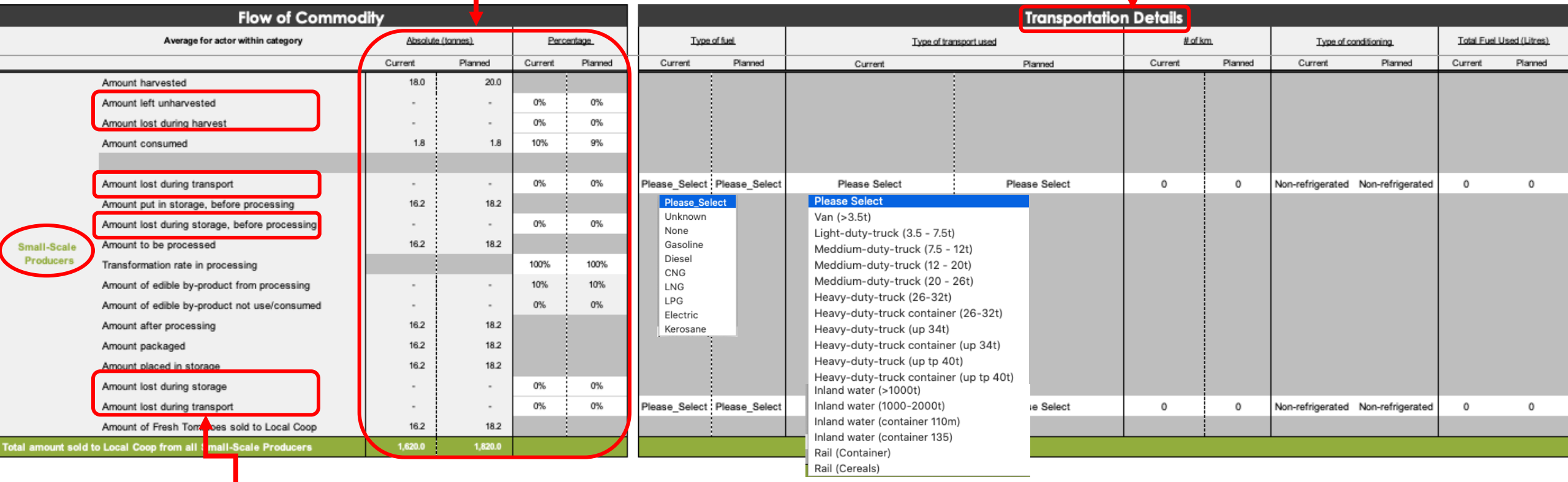
		Small-scale producer (HH)			Medium-scale producer (HH)			C		
For the SDG Tracker, can this category of actor be defined as "small-scale"?		Yes			No			Yes		
		Current	Planned		Current	Planned		Current	Planned	
Value-Chain (Meso) Level Data	Total Amount Harvested			Tonnes			Tonnes			Tonnes
	Total Land used for Production			Ha			Ha			Ha
?	Average Yield			Tonnes/Ha			Tonnes/Ha			Tonnes/Ha
	Total Emissions Associated with Production			tCO_2e / yr			tCO_2e / yr			tCO_2e / yr
Individual (Micro) Level Data	Total Amount Harvested	0.0	0.0	Tonnes	0.0	0.0	Tonnes	0.0	0.0	Tonnes
	Total Land used for Production	0.0	0.0	Ha	0.0	0.0	Ha	0.0	0.0	Ha

EX-ACT results to integrate land-based emissions

COMMODITY TRACKER IN EX-ACT VC v.3.0

The tool calculates the flow of commodity in tons from each stage activity.

Transportation data: type of fuel, vehicle, km travel, and liter used



Flow of Commodity

Average for actor within category		Absolute (tonnes)		Percentage	
		Current	Planned	Current	Planned
Small-Scale Producers	Amount harvested	18.0	20.0		
	Amount left unharvested	-	-	0%	0%
	Amount lost during harvest	-	-	0%	0%
	Amount consumed	1.8	1.8	10%	9%
	Amount lost during transport	-	-	0%	0%
	Amount put in storage, before processing	16.2	18.2		
	Amount lost during storage, before processing	-	-	0%	0%
	Amount to be processed	16.2	18.2		
	Transformation rate in processing			100%	100%
	Amount of edible by-product from processing	-	-	10%	10%
	Amount of edible by-product not use/consumed	-	-	0%	0%
	Amount after processing	16.2	18.2		
	Amount packaged	16.2	18.2		
	Amount placed in storage	16.2	18.2		
	Amount lost during storage	-	-	0%	0%
	Amount lost during transport	-	-	0%	0%
	Amount of Fresh Tomatoes sold to Local Coop	16.2	18.2		
Total amount sold to Local Coop from all Small-Scale Producers		1,620.0	1,820.0		

Transportation Details

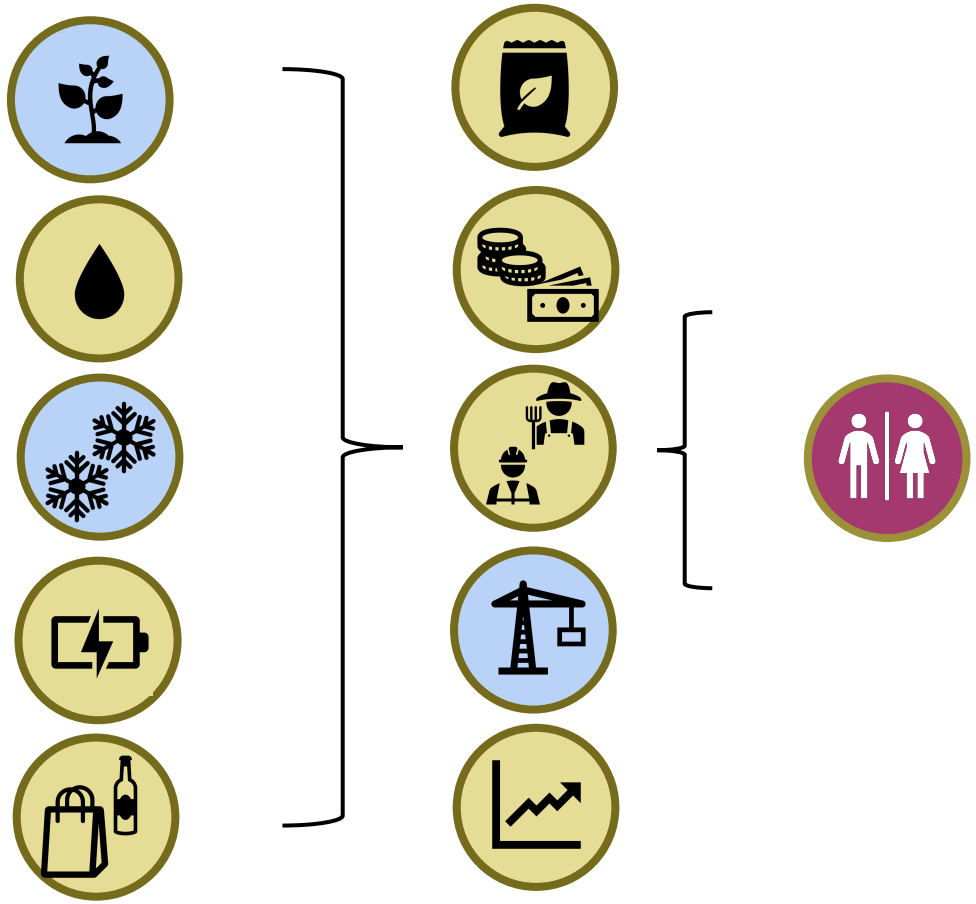
Type of fuel		Type of transport used		# of km		Type of conditioning		Total Fuel Used (Litres)	
Current	Planned	Current	Planned	Current	Planned	Current	Planned	Current	Planned
Please_Select	Please_Select	Please Select	Please Select	0	0	Non-refrigerated	Non-refrigerated	0	0
Please_Select	Please_Select	Please Select	e Select	0	0	Non-refrigerated	Non-refrigerated	0	0

Please_Select
Unknown
None
Gasoline
Diesel
CNG
LNG
LPG
Electric
Kerosane

Please Select
Van (>3.5t)
Light-duty-truck (3.5 - 7.5t)
Meddium-duty-truck (7.5 - 12t)
Meddium-duty-truck (12 - 20t)
Meddium-duty-truck (20 - 26t)
Heavy-duty-truck (26-32t)
Heavy-duty-truck container (26-32t)
Heavy-duty-truck (up 34t)
Heavy-duty-truck container (up 34t)
Heavy-duty-truck (up tp 40t)
Heavy-duty-truck container (up tp 40t)
Inland water (>1000t)
Inland water (1000-2000t)
Inland water (container 110m)
Inland water (container 135)
Rail (Container)
Rail (Cereals)

Track the flow of food losses throughout the value chain

ACTIVITY DATA MODULES IN EX-ACT VC v.3.0



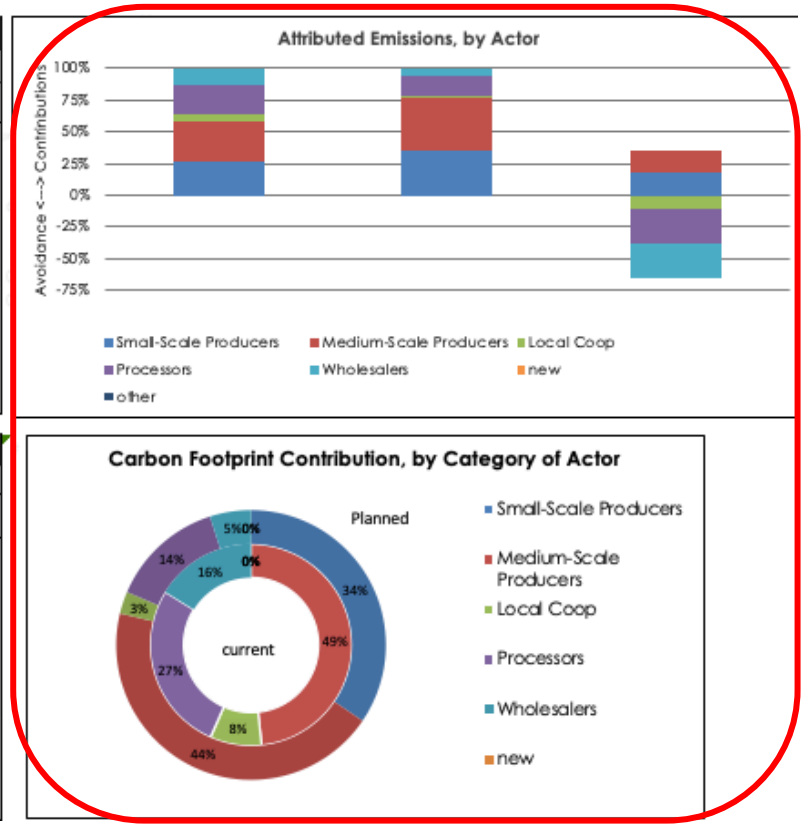
Activity Data GHG | Activity Data Economic | Women & Youth labour participation

GHG emissions, and economic assessments are done for both the **current** and **planned** scenarios at a **micro** (individual) and **meso** (category of actor) level.

RESULTS IN EX-ACT VC v.3.0

Greenhouse Gas Emissions (tonnes of CO2-e)		Current	Planned	Change
Total GHG Emissions (tCO2-e per year):		18,784	17,078	-1,706
Total GHG Emissions, by category of actor:	Small-Scale Producers	5,000	6,000	1,000
	Medium-Scale Producers	6,000	7,000	1,000
	Local Coop	1,097	445	-652
	Processors	4,195	2,668	-1,527
	Wholesalers	2,491	965	-1,527
	new	0	0	0
	other	0		0
Total GHG Emissions, by activity:	Primary Production	11000	13000	2,000
	Processing	852	852	0
	Marketing	3033	1174	-1,859
	Transportation	14	27	13
	New Infrastructure	-	0	0

Carbon Footprint (tonnes of CO2-e per tonne of product) 1		Current	Planned	Change
Overall Carbon Footprint, entire Value Chain:		10.62	8.34	-2.27
Carbon Footprint, by category of actor:	Small-Scale Producers	0.00	3.30	3.30
	Medium-Scale Producers	4.21	4.23	0.02
	Local Coop	0.72	0.25	-0.47
	Processors	2.37	1.30	-1.07
	Wholesalers	1.41	0.47	-0.94
	new	0.00	0.00	0.00
	other	0.00	0.00	0.00
Carbon Footprint, by activity:	Primary Production	62.4	66.9	4.5
	Processing	0.2	0.2	0.0
	Marketing	0.7	0.2	-0.5
	Transportation	0.0	0.0	0.0



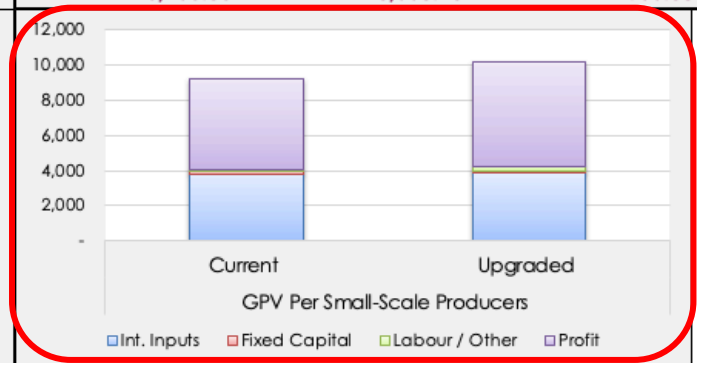
RESULTS IN EX-ACT VC v.3.0

Economic Analysis

Currency for the economic analysis is in USD

Small-Scale Producers

	Current	Planned		Change
Total Gross Production Value	919,083.33	1,021,203.70	▲	102,120.37
Total Gross Value Added	539,453.70	636,944.44	▲	97,490.74
Total Net Value Added	525,564.81	623,055.56	▲	97,490.74
Total Net Income	510,564.81	600,648.15	▲	90,083.33
Net Income, per individual (or HH)	**5,105.65**	**6,006.48**	▲	**900.83**



Employment by Activity

In full time equivalents

250 days = 1 full time employ...

Activity
Primary Production
Storage (pre-processing)
Processing
Packaging
Storage / Display
Transportation

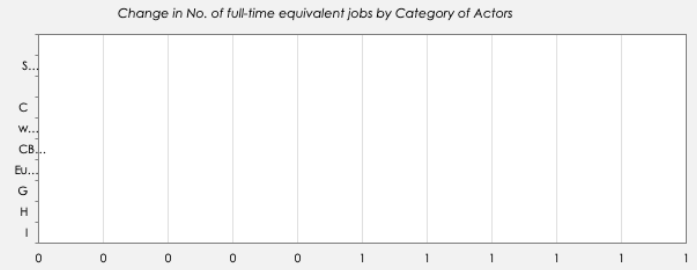
Total full-time equivalent jobs created or lost:

Employment along the VC

Employment by Category of Actor

In full time equivalents

Category of Actor	Current	Planned	Change
Small-scale producer (HH)	0.0	0.0	0.0
Medium-scale producer (HH)	0.0	0.0	0.0
C	0.0	0.0	0.0
women driven cooperative	0.0	0.0	0.0
CB-cooperative	0.0	0.0	0.0
Europe warehouse	0.0	0.0	0.0
G	0.0	0.0	0.0
H	0.0	0.0	0.0
I	0.0	0.0	0.0
Total full-time equivalent jobs created or lost:	**0.0**	**0.0**	**0.0**



RESULTS IN EX-ACT VC v.3.0

Gender and Youth Analysis

Women Participation in the VC

Category of Actor	Ownership Number of women in ownership			Management Number of women in managerial positions			Employment Number of women employed		
	Current	Planned	Change	Current	Planned	Change	Current	Planned	Change
A	0	0	0.0	0	0	0.0	0	0	0.0
B	0	0	0.0	0	0	0.0	0	0	0.0
C	0	0	0.0	0	0	0.0	0	0	0.0
D	0	0	0.0	0	0	0.0	0	0	0.0
E	0	0	0.0	0	0	0.0	0	0	0.0
F	0	0	0.0	0	0	0.0	0	0	0.0
G	0	0	0.0	0	0	0.0	0	0	0.0
H	0	0	0.0	0	0	0.0	0	0	0.0
I	0	0	0.0	0	0	0.0	0	0	0.0
Total:	0	0	0	0	0	0	0	0	0

NEW

SDG TRACKER IN EX-ACT VC v.3.0

Indicator 2.3.1 - *Production per Labour Unit of Small-Scale Food Producers**

Indicator 2.3.2 - *Average Income of Small-Scale Food Producers**

Indicator 5.5.2 - *Proportion of Women in Managerial Positions*

Indicator 6.4.1 – *Change in Water-use Efficiency over time (for MIMEC sector only)*

Indicator 9.4.1 - *CO_2 Emission per Unit of Value Added (for manufacturing sector)*

Indicator 12.3.1 - *Food Loss Index (for specific commodity)*

*users are responsible for identifying if category of actor should be considered small-scale

OUTPUTS OF EX-ACT VC v.3.0

Environmental indicators

- GHG emissions
- Carbon footprint
- Food loss
- Water usage

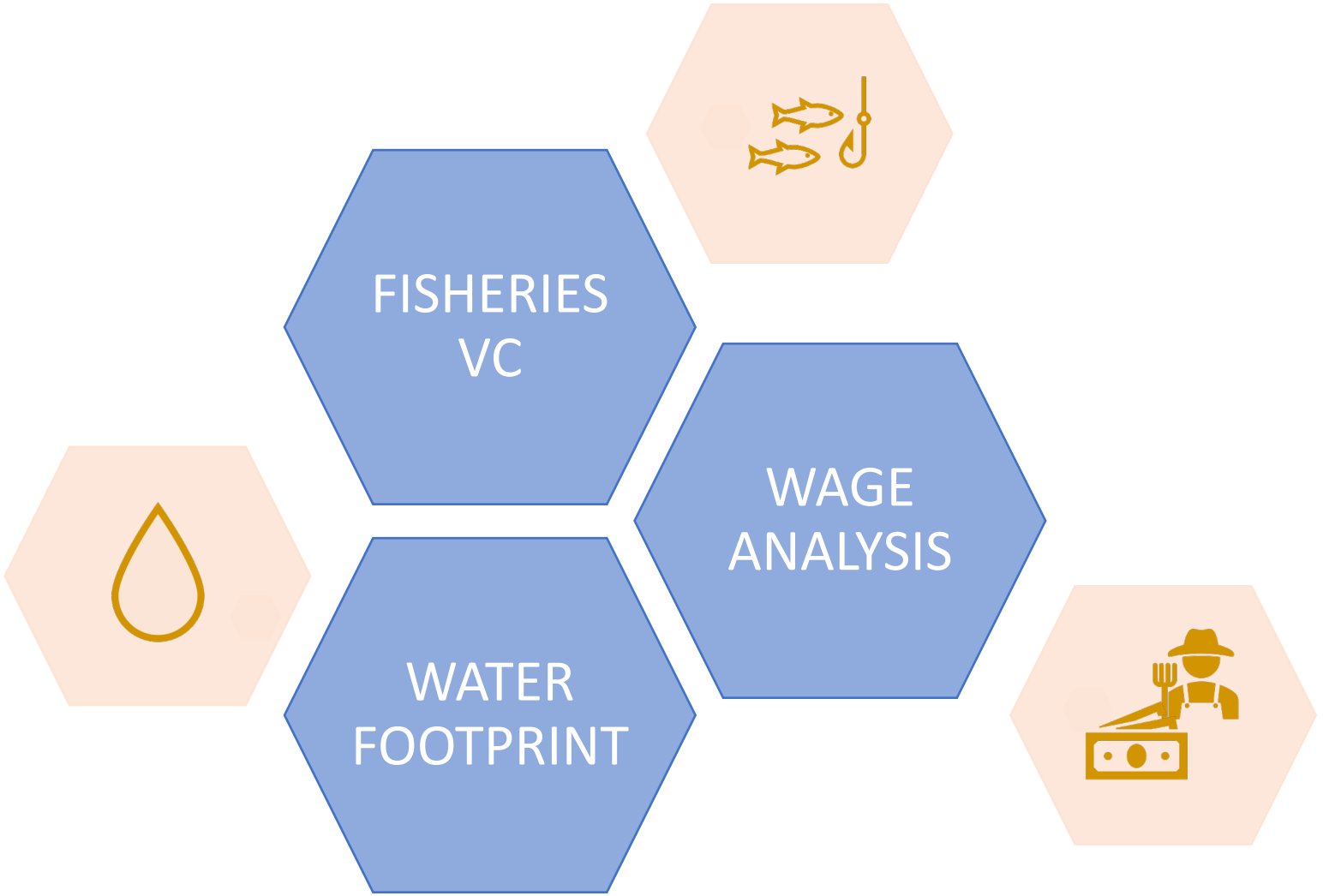
Socio-economic indicators

- Economic value of climate mitigation analysis
- Gross production value / G&N value added
- Net income
- Employment indicators
- Gender & Youth inclusion

SDG indicators

- SDG #2 Zero hunger
- SDG #5 Gender Equality
- SDG #6 Clean water and sanitation
- SDG #9 Industry, innovation and infrastructure
- SDG #12 Responsbile consumption and production

FUTURE DEVELOPMENTS



Thank you!

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Luca Mershed
Alice Moreau
Miquel Saludas

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For more information, please visit:

http://www.fao.org/tc/exact/ex-act-home/en/

http://www.fao.org/climatechange/epic/home/en/

Food and Agriculture Organization of the United Nations