BUSINESS MODEL SCENARIOS AND
SUITABILITY MAPPING FOR LANDSCAPE RESTORATION

A TRAINING MANUAL

SIWI
IWMI International Water Management Institute

Acronyms and Abbreviations

AWM	Agricultural Water Management
BCM	Billion cubic meters
BMC	Business Model Canvas
CRGE	Climate Resilient Green Economy
EFCCC	Environment Forestry and Climate Change Commission
ETB	Ethiopian birr
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GHG	Greenhouse Gas
IAIP	Integrated Agro-Industrial Park
IWMI	International Water Management Institute
MFI	Microfinance institution
Mha	Million hectares
NFSDP	National Forest Sector Development Program
NGO	Non-governmental Organization
RRC	Rural Resource Center
RTC	Rural Transformation Center
SDG	Sustainable Development Goals
SIWI	Stockholm International Water Institute
SLM	Sustainable Land Management
UN	United Nations
USD	United States Dollar

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Introduction

The economy of Ethiopia is heavily dependent on rainfed agriculture in which smallholder farming accounts for more than 90% of the national agricultural output. The agriculture sector is also a major driver of forest and landscape degradation as smallholder farmers resort to extensive farming to increase output. This fuels conversion of forest land into agricultural land. Also, the mixed crop-livestock agricultural system prevalent in the country aggravates overgrazing and brings about land degradation. In combination with rapid population growth, demand for fuel wood, recurrent droughts and entrenched poverty, this puts immense pressure on Ethiopia's natural resources and poses a critical threat to land and livelihoods (Haileslassie et al. 2020).

The need to maintain strong economic growth and attain ambitious development goals makes it imperative for Ethiopia to protect its existing forests and restore degraded areas. Indeed, policies, strategies, proclamations, programs and plans have been developed since the 1990s to safeguard the country's water and land resources and to address the challenges of conservation and development of natural resources (Birhane et al. 2017). However, successes in implementation of such restoration initiatives in degraded landscapes have been localized and context-specific.

There is a need to develop skills and knowledge to be able to implement diverse and sustainable land management (SLM) practices in degraded lands. There is also a need to explore the possibility of integrating income-generating activities with integrated landscape management practices and designing sustainable business models that can connect economy and ecology.

To be able to implement income-generating activities that produce short-term economic benefits, we need to understand various business models and conduct suitability mapping of landscape restoration measures. This calls for identifying institutions and governance mechanisms relevant to these objectives and testing the economic viability of different activities that can be practiced within the restored areas. As an attempt to address these challenges, this training module is designed to aid practitioners' understanding of business model scenarios and suitability mapping and to build their capacity to implement and manage business streams and income-generating activities.

Why This Course Material?

Programs aimed at reversing land degradation face numerous institutional and socioeconomic challenges. These include, among others, the lack of incentives for short-term investment; low investment by communities in natural resources management (as it offers little immediate financial reward); reluctance of public sector institutions to invest sufficiently in natural resources management (as it does not give immediate political reward); and sectoral fragmentation (Mekuria et al. 2020). In poor communities, extraction of short-term economic returns from land and natural resources is a greater attraction than the potential of investing in longer-term environmental restoration and economic and ecosystem benefits. Investment in land and natural resource restoration, therefore, requires a balance between short-term economic returns and longer-term sustainability and environmental goals. Individuals, households and communities are more likely to invest in activities that will lead to long-term land rehabilitation if there is promise of a near-term economic benefit as well. This training program offers, in the form of interactive sessions and experience sharing, interdisciplinary knowledge that is necessary for sustainable land restoration management.

Target Audience

This training module is designed for farmers, foresters, pastoralists and local communities with an interest in landscape restoration and for key actors responsible for governing Ethiopia's natural resources.

Objectives of the Training Modules

- Identifying opportunities to improve both livelihoods and the environment through exclosures and solar power-based irrigation;
- Assessing the feasibility of encouraging investment in Rural Resource Centers (RRCs);
- Developing a new methodology for mapping the suitability of exclosures;
- Creating awareness of social entrepreneurship as (an alternative) career option;
- Developing and improving business skills and perspectives (management and planning) to enable creation of business models and improve communication skills;
- Strengthening the entrepreneurial competencies of individuals engaged in natural resources and landscape management; and
- Introducing commonly used tools to analyze the economic viability of business models for sustainable management of land restoration practices.

How to Use This Manual

The manual uses the following training tools:

- Practical exercises. These exercises will help you in proactively learning entrepreneurial concepts and applying them in your future business.
- Notes. Note taking makes you to focus while reading the manual. Studies on learning have shown that actively engaging with a topic by taking notes helps learners understand concepts better and recall the information later. Therefore, answering questions given in different parts of this manual and formulating questions to your trainers will help you perform to the best of your ability.
- Evaluation. Compare stories about different business models used in landscape restoration and use them to improve your own idea and strengthen the case for landscape restoration.

Designation of Symbols

	When you see this icon, it means you have activities to do or questions to answer.
	This icon signifies that the information is extremely important.
	This icon means you have to complete assessments that measure your capability and readiness.

Module 1

Introduction

In this module we describe some of the terms and concepts used in the context of developing business model scenarios for landscape management. We also discuss the need for business planning in restoration programs, and present case studies on exclosures and solar pump-based irrigation, relating them to the need to develop business model scenarios.

1.1. Key Terms

Business model. A business model describes the rationale for how an organization can create, deliver and capture value in economic, social, cultural or other contexts (Nosratabadi et al. 2019). Business model construction is a part of business strategy. Also called business model innovation (Figure 1), this process describes the basic logic of how an organization can create value by defining (i) the organization's value offering; (ii) how that value is created within the organizational system; (iii) how the created value is communicated and delivered to the customer; (iv) how it is captured in the form of revenues to the company; (v) how the value is distributed within the organization and to its stakeholders; and (vi) how the basic logic of value creation is refined to ensure sustainability of the business model in the future (Cagarman et al. 2020).

In theory and practice, the term 'business model' is used for a broad range of formal and informal descriptions. It describes the core aspects of a business, including its purpose, the business process, the target customers, its offerings, strategies, infrastructure, organizational structure and culture, sourcing, trading practices and operational processes and policies (Misango and Ongiti 2013).

Figure 1 illustrates the circular nature of the entire process of business model innovation. It divides the process into three main components: concept design, detail design and implementation. In most businesses, the process of business model innovation is not a singular event; it is followed by others to address the challenges and opportunities thrown by the environment and to identify new or underutilized resources and capabilities. As indicated in Figure 1, the process is descriptive, showing how business model innovation happens in practice; and prescriptive, providing guidance on how sustainable business modeling should ideally be carried out. Business model innovation is typically cyclical or repetitive, i.e., once completed, most organizations will repeat it to adapt or react to changes in their industry and environment. It consists of eight sequential but iterative phases or steps, which means that while the organization is roughly following the business model innovation step by step, it may also go back and forth, repeating or omitting some stages according to its requirements and limitations.

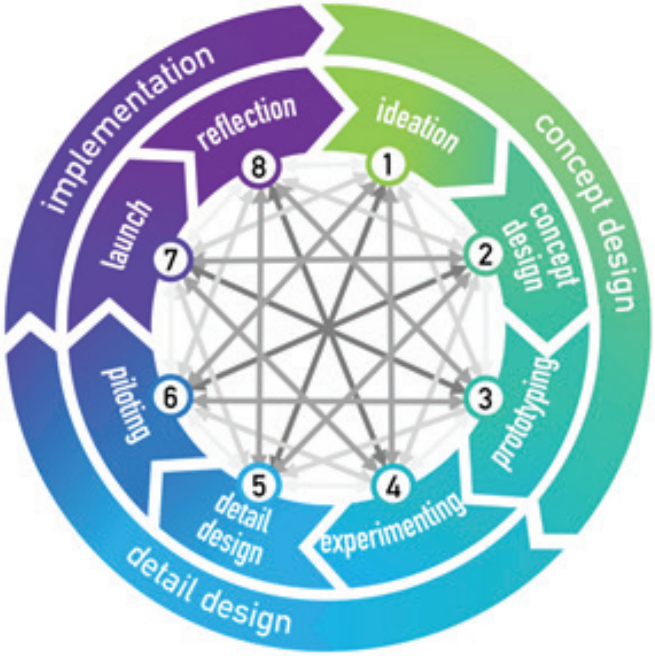


Figure 1. Business model innovation and its circular processes.

Sustainable business model. This concept encompasses four propositions: (i) the value proposition, which provides measurable ecological and/or social value in concert with economic value; (ii) the supply chain, which involves suppliers who take responsibility toward their own as well as the focal company's or business's stakeholders; (iii) the customer interface, which motivates customers to take responsibility for their consumption as well as for the smallholders farmers that are engaged in the business (in this case, farmers engaged in beekeeping, livestock fattening, planting high-value plants within exclosures and farmers who engage in solar pump-based irrigation); and (iv) the financial model, which reflects an appropriate distribution of economic costs and benefits among the various actors involved in the business model and accounts for the farmers' ecological and social impacts.

A business model for sustainability assists in the achievement of that goal by following (i) resource efficiency, (ii) social relevance, (iii) localization and engagement, (iv) longevity, (v) ethical sourcing, and (vi) work enrichment.

Value proposition. We see in Figure 2 and Figure 3 that at the heart of the business model is the value proposition, which we promise to deliver to our customers (Who). The value proposition is how you create value for a specific set of customers. The other parts of the business model are about what resources you will need, how you will reach your customers and entice them to pay for value and how a company converts those payments into profit. As we can see in

the iteration presented in Figure 2, everything is changing and constantly shifting, so you need to ensure that you are flexible and able to adapt your business as others chase and compete for your business.

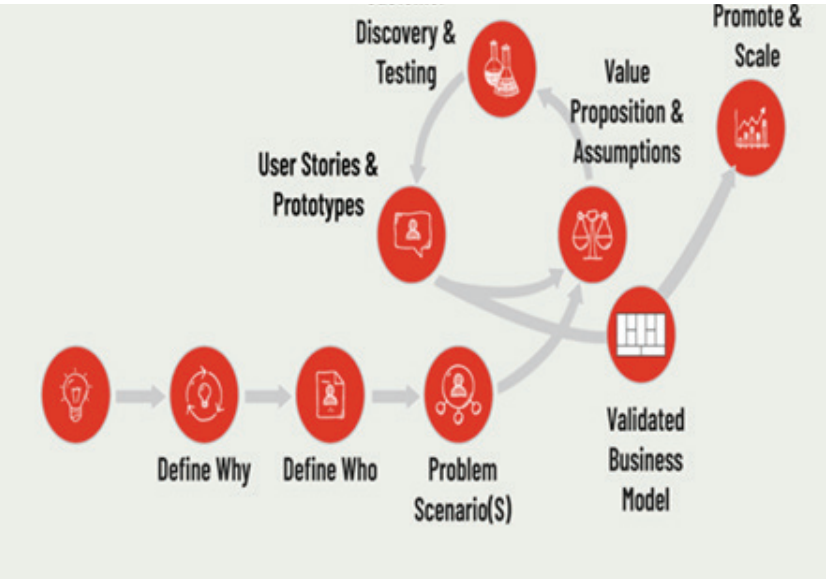


Figure 2. Business model iteration.

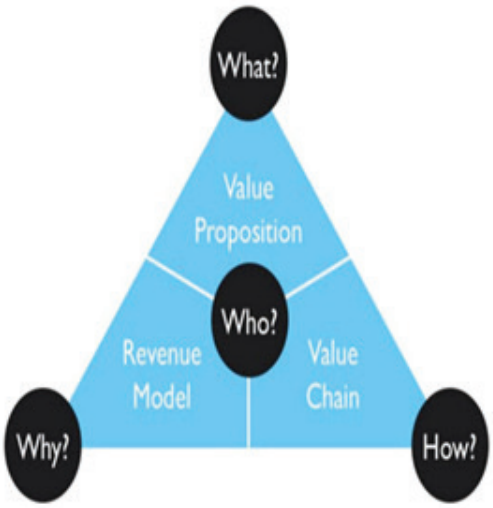


Figure 3. A business model.

1.2. The Need for Business Planning for Restoration Measures

The issue of land degradation and the need to restore degraded landscapes will persist in the future. For instance, the demand for wood and forest products in Ethiopia is expected to increase by 27% over the next 20 years (EFCCC 2020). Currently, 12.9% of the national gross domestic product (GDP) comes from forests; an estimated 57 million people, more than half of the population, work full-time or part-time in the forest sector. More than 11 million rural households rely almost exclusively on forests for their sustenance (Wassie 2020).

That number is expected to rise as the COVID-19 crisis could threaten the jobs of an estimated 1.5 million Ethiopians, primarily the urban poor. Many of them will migrate back to their rural homelands. They will need new jobs and opportunities. The forest sector can help fill this gap. Realizing the importance of managing natural resources so as to create meaningful rural jobs, the government has designed several policies, programs and strategies: The National Forest Sector Development Program (NFSDP) has a target of creating 630,000 full-time jobs such as managing tree nurseries, planting seedlings, protecting forests and marketing forest products. The forest sector also has a major role in the Climate Resilient Green Economy (CRGE) strategy, which lays out a path for Ethiopia to become a middle-income country by 2025. Key to realizing that vision is protecting the remaining 17.35 million hectares (Mha) of forests and increasing forest cover to 30%.

A new report (Trees, Forests and Profits in Ethiopia) published by the Environment, Forest and Climate Change Commission (EFCCC) and the World Resources Institute (2020) shows that we can help meet these economic targets by sustainably managing trees over 1 Mha of existing private/communal and state-owned production forests and establishing 310,000 ha of new forest plantations. Creating that number of new plantations would require a significant private investment of USD 638 million (23 billion Ethiopian birr [ETB]) but could deliver a return of USD 1.91 billion (ETB 69 billion), or USD 3 for every USD 1 invested (Pistorius et al. 2017).

The task of achieving landscape restoration and creating meaningful jobs and benefits for local communities requires a holistic approach. It needs a process to restore the ecological functions of a landscape and revitalize the social and economic functions. Also, landscape restoration, in this case the restoration of degraded landscapes through the establishment of exclosures, should not be planned without considering the impact on livelihoods and without adopting sustainability as a mandatory objective. Indeed, local communities often question the value of exclosures because such initiatives seem to lack focus on potential economic benefits (Mekuria et al. 2017). This suggests that without a clear promise of such

benefits, local communities would have no real incentive to support government efforts to establish and manage exclosures. This will put the success of the intervention at risk.

Business models can be effective tools to bridge the gap between public interest in restoring landscapes and ecosystem services and the perceived short-term economic losses at the local level. In this training manual, we illustrate a business model framework for exclosures using three potential revenue streams. In addition, we illustrate business model scenarios based on smallholder solar-powered pumps, using three potential revenue streams (see Section 1.3). This approach provides guidance on application of business models within exclosures while ensuring environmental, social and financial feasibility, and promoting local ownership and engagement of communities in the implementation (Mekuria et al. 2020).

In another perspective, restoration must be recognized as an investment opportunity that can help smallholder farmers and industries sustain their operations over the long run. Land degradation issues are particularly relevant to businesses—such as agriculture, food, beverages, forestry including paper and pulp and mining—that directly extract or harvest from the land. But land degradation is relevant to other sectors—such as chemicals, apparel, tourism, insurance and finance—too through indirect links via supply or value chains. Although businesses that are not in direct contact with land often do not see it as part of their core business, this training module emphasizes that land degradation is a critical issue for all businesses. While risk profiles may differ, it can directly impact a company's cost structure and profitability by affecting, for example, the availability and cost of resources.

It takes 2,000 years to generate about 10 centimeters (cm) of topsoil. That is a long time. Soil is practically a non-renewable resource. Over-exploitation of this land-based natural capital is costing us huge amounts of money. It is undermining the future of many businesses and livelihoods.

1.3. Case Studies: Exclosures and Solar Pump-based Irrigation

In this sub-session we present two case studies, one dealing with exclosures (Box 1) and the other solar pump-based irrigation (Box 2).

Box 1. Exclosures

Exclosures are common land areas. They are traditionally open access lands where woodcutting, grazing and other agricultural activities are forbidden or strictly limited so as to allow natural regeneration. Exclosures have been tested in the northern and southern parts of Ethiopia and have proven to be successful.

However, to maximize the benefits and ensure sustainability, it is crucial to incentivize local communities to get engaged with exclosure initiatives and assist the stakeholders in carrying out activities.

With this in view, business models were adapted to explore the feasibility of exclosure land restoration. The activities that can be carried out within exclosures so as to maximize benefits to the communities and ensure sustainability are beekeeping, harvesting fodder for livestock fattening, and cultivating high-value plant, fruit and herb species.

Source: Mekuria et al. 2020.

Box 2. Solar Pump-based Irrigation

In this part we discuss potential business models for solar pump irrigation to improve agricultural production, productivity and income. These models provide evidence to investors, policy-makers and practitioners that solar pump irrigation can be both suitable and sustainable.

Solar-powered pumps offer a low-cost and environmentally friendly alternative to electric irrigation technologies. Research suggests that investing in solar power-based irrigation can benefit smallholders, although the profit level depends on the type of crops cultivated, the water delivery and application systems employed and the size of cultivated area. The other factors that influence profits include access to markets and labor and input costs, although these are not unique to solar pump irrigation.

Given the number of existing and potential motor pump users in Ethiopia—between 210,000 and 400,000—the scope for expanding the solar pump market for irrigation appears to be significant.

Source: Otoo et al. 2018

Question for Group Discussion

Three things you have learned so far, two things that have surprised you, and one question you have. And Present it to the

Module 2

Methods

Module Objective

At the end of this training module, you should be able to:

- Prepare a business model canvas for land restoration measures
- Define each block of a specific part of the business model
- Spot potential weaknesses and strengths in your business
- Use that information to anticipate challenges and shape your response to them
- Identify what is most important in your business model

2.1. Business Model Framework for Exclosures

Governments are seeking to address the challenges of biodiversity loss and climate change by committing to several ambitious goals. These are regional and international commitments to restore ecological integrity while at the same time improving human well-being through multifunctional landscapes. However, scaling up restoration of degraded land is difficult as experience is limited, and understanding of the case for restoration is still weak in most sectors. Financing for restoration programs continues to be a challenge although it has been increasingly more forthcoming from multiple sources such as climate funds, multilateral banks and even the private sector. What is needed are bankable restoration projects that offer demonstrable returns on investment—be they direct economic returns or quantifiable benefits in terms of ecosystem services.

While demonstrating an adaptive business model, this sub-session will present the logic behind activities that can be integrated within exclosures. We ask important questions such as: What will the costs of operation be? Can finance to cover these costs be accessed? Who will benefit from our activities? What materials and skills do we need to carry out these activities?

A recent research report by Mekuria et al. (2020) proposes the use of an adapted business model that identifies high-potential economic opportunities including enhanced short-term economic benefits from restoration activities within exclosures. This model highlights three revenue streams or management options: beekeeping, harvesting fodder for livestock fattening and cultivation of high-value plant species.

2.1.1. Triple-layered Business Model Canvas

Business model design commonly utilizes a tool called the business model canvas (BMC) to build up elements of the value proposition, value delivery and value capture offered by the business.

- Value proposition: As stated earlier, this is a brief explanation about the value you pro pose to give to stakeholders of the business, including customers.
- Value creation and delivery: How do you propose to bring this value to the customers and other stakeholders?
- Value capture: How will you retain value for yourself, and how will other stakeholders retain value from your activities?

The business model canvas (BMC) is a template of building blocks that together describe how a business model will work. It enables you to try out different combinations of elements, creating a number of alternative business models. This training manual introduces the 'triple-layered business model canvas' proposed by Joyce and Paquin (2016). As the name suggests, this tool allows us to consider three layers of a business model: economic, environmental and social (Figures 4-6).

TIP BOX

Business Idea Communication

Give some thought to how your business case can spark the interest of your stakeholders. You could think of the following questions:

. How do I make people aware of the problem(s) that my business case is trying to tackle?
. What is my vision of hope?
. How do I spark participation by various stakeholders in my business?

Economic Layer. This layer of the business model covers several components. They include, among others, activities (e.g., in our case, this can be the three suggested revenue streams), customer relationships (partnerships), value proposition and revenues (Figure 4). An explanation of these components is given along with their respective practical cases in Table 1. The business model canvas is summarized in Table 2.

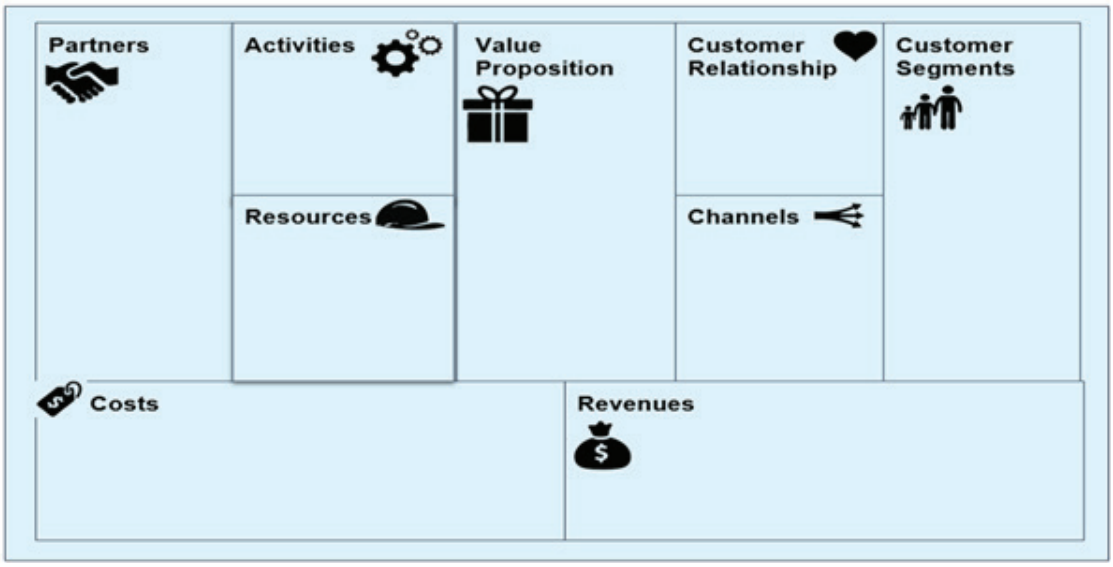


Figure 4. The economic layer of the business model.

Table 1. Nine blocks comprising the economic layer of the business model canvas (BMC).

Block	Explanation	Case 1: Beekeeping, honey production Case 2: Livestock fattening
Value proposition	This refers to the innovative value or benefits you are proposing to the stakeholders, including customers. This value could be a service, a product, or a combination of both.	• Sustainable supply of high-quality honey and honey products at a constant price • Sustainable supply of fattened animals at a constant price • Low price with mass purchase of fattened animals
Customer segments	This refers to the different groups of people or organizations you are trying to attract through your value proposition. Example: middle-income parents in Ethiopia who are environmentally aware.	• Domestic and foreign consumers of honey and honey products • Urban municipalities for fattened animals • Institutions such as universities

Channels	This refers to the ways by which you will communicate and reach your customer segments to deliver the value proposition. Essentially, channels represent the interface with customers and comprise communication, distribution, sales as well as after-sales processes. E.g., selling products in health food stores.	• Based on customer activity, you could opt for business-to-business or business-to-consumer approaches through online, phone or face-to-face channels at local and regional markets or at your own farm gate or at the exclosure.
Customer relationships	This refers to the kind of relationships you will establish with certain customer segments. This is important for how you will retain customers or acquire new ones. E.g., a membership club, newsletter or face-to-face contact.	• Providing transportation service for mass sales • Forward selling to public institutions (domestic institutions that purchase mass production of fattened animals) • Contract production
Resources	This refers to physical assets such as machinery, financial assets, or intellectual assets such as human skills or employees needed for your activities.	• Land (exclosures) • Landscape • Good feed source • Equipment and tools • Water • Skilled manpower in honey processing

Activities	This refers to the activities that you need to perform in order to make the business model successful. E.g., marketing your services or how you produce your products. The main activities that should be carried out in your business.	• Production and supply of quality honey and honey products • Production and supply of fattened animals • Conserving degraded forest as in planting and managing of forest tree seedlings (for beekeeping), • Conserving degraded forest as in planting and managing grass and legumes (for fattening)
Partners	This refers to the individuals and organizations with whom you work together to make your product work. E.g., suppliers, distributors, etc. These alliances concern outsourced activities and are important to make the business model work. We can distinguish between four different types of partnerships: • Strategic alliances with non-competitors. • Cooperation: strategic partnerships with competitors. • Joint ventures to develop new businesses; and • Buyer-supplier relationships to assure reliable supplies	• Rural/urban land administration • Environment, forest and climate change office • Small and medium enterprise sectors to organize young people • Training and/research institutions • Credit institutions • Office of agriculture (agroforestry, apiculture, livestock) • Marketing and cooperatives office • Universities, hospitals and bakeries

Table 2. Sample business model canvas for beekeeping and honey production.

<table>
<tr>
<td rowspan="2"><u>Key partners</u>
•Rural/urban land administration
•Environment, forest and climate change office
•Small and medium enterprise sectors to organize young people
•Training and/research institutions
•Credit institutions
•Office of agriculture (agroforestry, apiculture, livestock)
•Marketing and cooperatives office
•Universities, hospitals and retail shops</td>
<td><u>Key activities</u>
•Production and supply of quality honey and honey products
•Conserving degraded forest by planting and managing forest tree seedlings (for beekeeping)</td>
<td rowspan="2"><u>Value proposition</u>
• Sustainable supply of high-quality honey and honey products at a constant price</td>
<td><u>Customer relationships</u>
•Providing transportation service for mass sales
•Forward selling to public institutions
• Contract production</td>
<td rowspan="2"><u>Customer segments</u>
•Domestic and foreign consumers of honey and honey products</td>
</tr>
<tr>
<td><u>Key resources</u>
•Land (exclosures)
•Landscape
•Good feed source
•Equipment and tools
•Water
•Skilled m anpower i n honey processing</td>
<td><u>Channels</u>
• Awareness creation at schools, public gatherings
• Based on customer activity we could opt for business-to-business or business-to-consumer approaches through online, phone or face-to-face channels using local and regional markets, or at our own farm gate, or at the exclosures.</td>
</tr>
<tr>
<td colspan="3"><u>Cost structure</u>
Investment costs to buy investment goods like beehives, storage material, cloth. Fixed and variable costs involved in producing, maintaining and marketing of the product.</td>
<td colspan="2"><u>Revenue streams</u>
Honey and honey product sale</td>
</tr>
</table>

Environmental Layer. This layer of the BMC allows us to understand how the organization will generate more environmental benefits than environmental impacts. At the center of the canvas is the functional value. It describes what a product or service will offer in terms of physical quantities. The left side of the canvas evaluates the environmental impacts or benefits that material sourcing, production, supplies and outsourcing will generate. The right side of the canvas describes the environmental impacts or benefits of the offered product or service from the point of delivery until the end of its life cycle. At the bottom of the canvas is the value capture for the environment and for our landscapes in the form of environmental benefits and environmental impacts (Figure 5). More detailed explanations of these concepts are provided in Table 3.

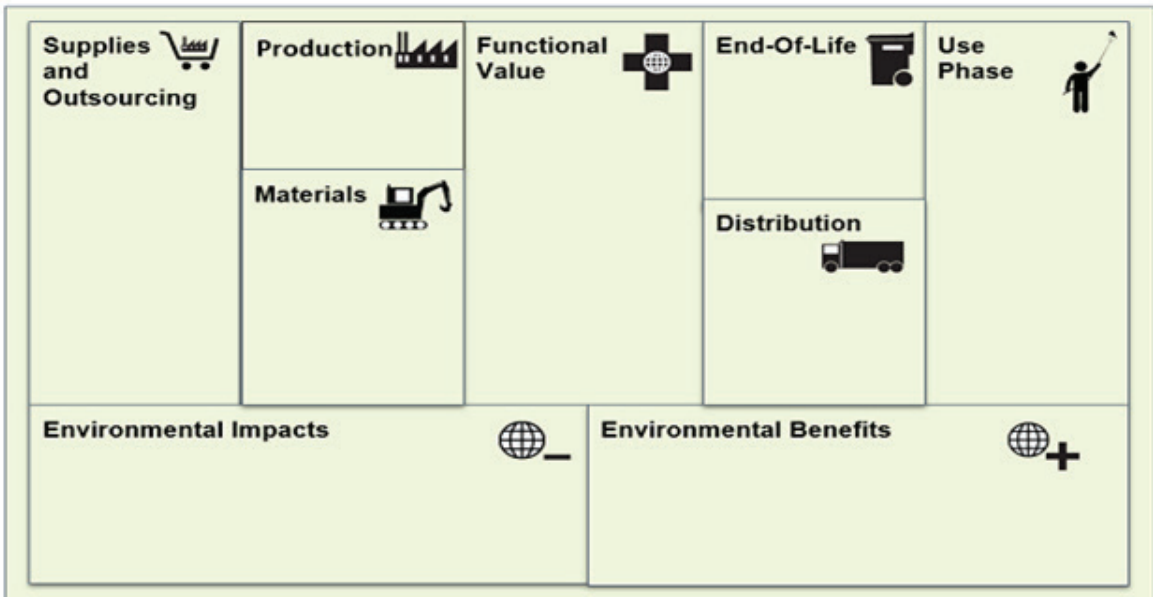


Figure 5. The environmental layer of the business model.

Table 3. Nine blocks of the environmental layer of the BMC.

Block	Explanation
Functional value	The physical output of the service or product of the company. E.g., 100 x 1 kg boxes of almonds.
Materials	The biophysical stocks that are necessary to provide the service or product. These can be the input needed for the product, such as aluminum and steel, or the required infrastructure to deliver the service, such as computers, vehicles or buildings.
Production	This encompasses all activities that are necessary for generating the product or service which have an environmental impact. E.g., production of shipping boxes.
Supplies and outsourcing	All production materials that are not produced by the company itself. E.g., how much water and electricity will be required and where will this come from?
Distribution	What kind of environmental impact is generated by the distribution of the service or product to the customer? E.g., a delivery van using gasoline.
Use phase	The impact the product or service has once in the hands of customers. This includes normal usage, such as washing or charging, as well as maintenance and repair. E.g., the product needs to be washed using an electric washing machine.

End-of-life	The impact the product or service has at the end of its lifetime for the specific customer. Therefore, reuse, recycling, remanufacturing or disposal have to be taken into account. E.g., what harm/good can the product do if it entered the water system?
Environmental impact	Given all the information provided by the previously mentioned components, you can calculate the overall negative environmental impact of the business model. These environmental costs might be calculated in terms of CO_2 emissions, ecosystem impact, natural resource depletion, water consumption or biodiversity loss.
Environmental benefits	Critically, besides impacts, your business model should produce environmental benefits by restoring the landscape. You can specify the quantity of land (e.g., 100 ha of land restored), but also how the land will be restored (e.g., improved water saturation of the soil).

Social Layer. The social layer of the BMC takes a stakeholder management approach to explore an organization's social impact. It tries to depict the major social impacts that arise from the organization's stakeholder relationships. Doing so provides a better understanding of where an organization's primary social impacts are likely to be. It also provides insights for innovations to tweak the organization's actions and business model to improve its social value creation potential (Figure 6). The components of this layer are described in Table 4.

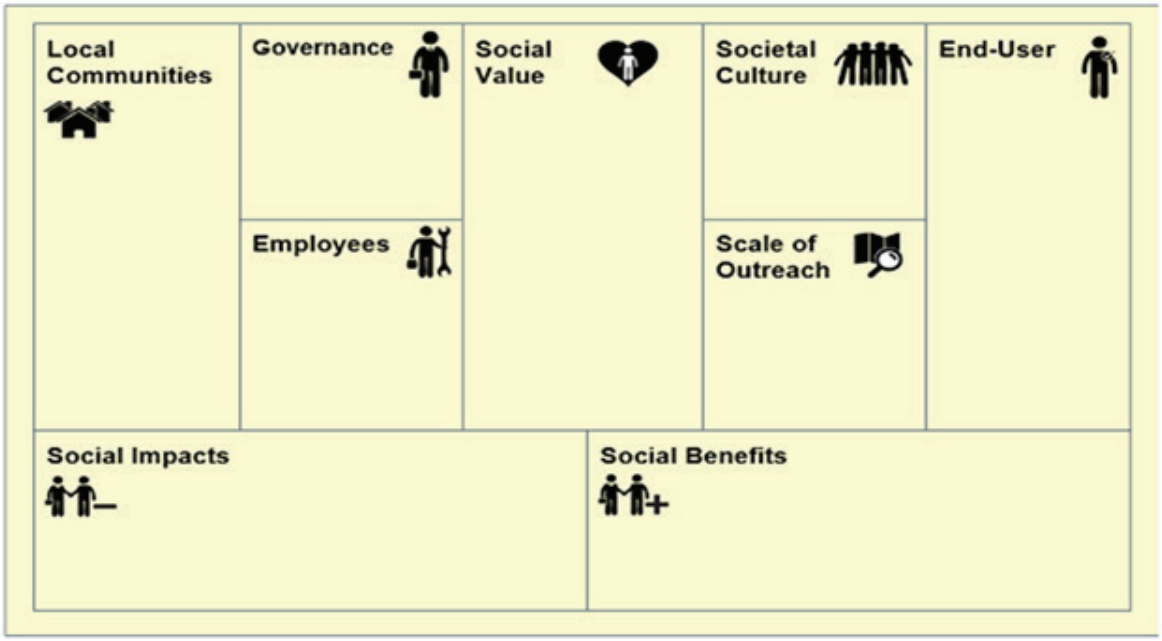


Figure 6. The social layer of the business model.

Table 4. Nine blocks of the social layer of the BMC.

Block	Explanation
Social value	How the business model can create value for stakeholders and for society as a whole, and hence the social value that can be created for the suppliers of the company, its employees and customers. For this, consider your previous exercise on stakeholder analysis and ask what value the new business is creating for each group. E.g., enhance the quality of life in the local community.
Employees	Fair treatment and balanced characteristics of the employees of your company. E.g., number of employees, fair pay, gender balance and respect for ethnicity.
Governance	The internal and external organizational structure and the decision-making processes of the company. E.g., transparency to external parties about the hierarchical structure. As a start-up you may feel that this component is less relevant; however, it may be of critical importance for receiving grant funding or donations.
Communities	This includes the local community of the landscape and any other local community that is influenced by the production facilities or business partners. E.g., how are you positively impacting the local community?
Societal culture	How will your business model impact the culture of the people? E.g., does it promote a culture of shared responsibility for the well-being of the landscape? Or does it promote a feeling that you can pay your way out of problems?
Scale of outreach	What kind of relationships would you have with your stakeholders? Does the business model enable you to develop long-standing relationships with numerous people, or is it focused on an exclusive segment?
End-users	The end-users do not necessarily have to be the customers but those that are really using the product or service at the end. This deals with how the value proposition is fulfilling the need of the consumer and contributing to his or her quality of life. E.g., providing nutrition.
Social impacts	The social cost of your activities. E.g., working hours, cultural heritage, health, fair competition, loss of communal space as well as lack of short-term economic benefits, etc.

2.2. Business Model Framework for Solar Pump-based Irrigation

This session is based on the work by Otoo et al. (2018) entitled 'Business Model Scenarios and Suitability: Smallholder Solar Pump-based Irrigation in Ethiopia'. The framework discussed in this document includes business model components that can help private and public sector investors understand the entry points for strengthening and sustaining market development in the agricultural water management (AWM) sector. The report identifies three business model scenarios (individual purchase, out-grower or insurer scheme, and supplier model with bundled financing) that present opportunities for investing in smallholder solar pump-based irrigation.

Such a framework is important to move away from conventional donor-funded and publicly-funded development projects or interventions, and to support the development of market-driven mechanisms to catalyze the scaling up of solar irrigation pumps. Such a business model framework supports market-driven mechanisms by addressing most of the commonly

cited stakeholder concerns related to expansion of the private sector market, including (i) affordability (cost of the technology relative to farmer income levels); (ii) awareness (knowledge of the technology); (iii) accessibility (options for obtaining the technology); and (iv) lack of customization (capacity to match technological solutions with farmer needs). Also, innovative business models enable assessment of the likely yield from different approaches to taking the technology to market (Chesbrough 2010). The current context points to the need for smart business models that do not require sustained donor inputs but present opportunities for private market chain actor investment that could lead to sustained benefits.

Question for Group Discussion

What do you think will be the challenges and opportunities of solar pump irrigation in Ethiopia?

2.3. Data Sources and Information for Business Model Development

While developing business models, we can use a broad range of information sources including published and unpublished literature, key informant interviews, focus group discussions, secondary quantitative data and primary collected data.

Both the exclosure and solar pump irrigation business models plug in to several data sources. The exclosure business model is based on action research conducted by the International Water Management Institute (IWMI) and its partners, including local communities and their representatives (e.g., community watershed teams), universities, agricultural research systems and local administrative bodies. The solar pump irrigation business model draws from a study commissioned by IWMI (Alemayehu 2016) to collect data from the private sector, government officials, farmers using solar pumps for irrigation/drinking water, non-profit and research organizations implementing solar pump programs, and civil society organizations promoting renewable energy and/or agriculture. In addition, it relies on data from a 2015-2016 pilot case study of solar irrigation pumps used by men and women farmers, which was conducted through the Livestock and Irrigation Value chains for Ethiopian Smallholders (LIVES) and the Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) projects (Gebregziabher et al. 2016).

Question for Group Discussion

Select one idea to work out a first design using the triple-layered business model canvas. You may also wish to take multiple ideas from different sets forward to draw out initial designs.
Business Idea 1: Beekeeping and honey production
Business Idea 2: Harvesting fodder for livestock fattening
Business Idea 3: Cultivation of high-value plant species
Business Idea 4: Cultivation of fruit trees
Business Idea 5: Smallholder solar irrigation (machinery and production through to use)
Business Idea 6: Individual purchase
Business Idea 7: Out-grower or insurer scheme
Business Idea 8: Supplier model with bundled financing

Module 3

Background Analysis for Developing Business Models

Module Objective

At the end of this training, you should be able to:

- Explain and analyze the components involved in the development of business models

3.1. **Developing Business Models for Exclosures**

This business model consists of five main components: suitability mapping; environmental suitability (including climate adaptation); institutional, policy and regulatory context; financing mechanisms; and economic analysis (i.e., cost-benefit analysis).

3.1.1. **Suitability Mapping**

This session discusses the availability of suitable areas for establishing exclosures. We also look at the methods of assessing suitable areas. And then we discuss the suitability of exclosures for practising the three revenue streams of beekeeping, livestock fattening and cultivation of high-value crops.

Assessing Areas Suitable for Establishing Exclosures. Potential areas for establishing exclosures can be assessed using the GIS-based Multi Criteria Decision Analysis (MCDA) method (Kibret et al. 2020). This applied procedure involves seven steps: (i) definition of the conceptual framework; (ii) assigning a score/rank to each factor; (iii) creation of a constraint layer; (iv) integration of thematic layers and spatial models; (v) validation of suitability mapping; (vi) overlay of the identified suitable areas on the actual land-use map to determine suitability in agricultural and non-agricultural land-use areas; and (vii) aggregation of suitability within the target area and disaggregation by agroecology.

For example, GIS-based Multi Criteria Decision Analysis was used to identify suitable areas for exclosure initiatives to assess the potential of exclosure-based conservation in Ethiopia. It was found that about 11 Mha of the country's land area was suitable for establishing exclosures. Of this, a significant proportion (0.5–0.6 Mha, 4.5–5.5%) is currently under agricultural land use. In terms of propriety river basins, the largest extent of suitable area for exclosures was in the Abay (2.6 Mha) and Tekeze (2.2 Mha) river basins, which are hosts to water infrastructure

such as hydropower dams and are affected by siltation. The contribution of exclosures would solve a lot of problems in these lands (Kibret et al. 2020).

Another study (Mekuria et al. 2020) identified about 14.3 Mha of degraded lands in Ethiopia that could be considered for establishment of exclosures. The Environmental Policy of Ethiopia (FDRE 1997) encourages the restoration of degraded landscapes through forest development and establishment of exclosures on eroded or eroding hillsides. In this regard, Ethiopia has approximately 4 Mha of land with a slope greater than 30%, which makes these locations suitable for exclosures.

Group Discussion

Think about exclosures in your respective areas and evaluate them against the criteria provided to you and present your analysis to your colleagues.

Suitability of Exclosures for Integrating Revenue Streams. Suitability mapping also involves assessing whether the exclosures would be suitable for the planned revenue streams or income-generating activities. This session discusses suitability in respect of three revenue streams: beekeeping, forage harvesting for livestock fattening, and cultivating selected high-value plant species. In Boxes 3–5, we present the case for exclosures to host beekeeping (Box 3), cultivation of forage for livestock fattening (Box 4) and cultivation of high-value crops (Box 5).

Box 3. Suitability of Exclosures for Beekeeping

- Beekeeping can be an option for diversifying livelihoods while maintaining the natural environment within an exclosure. It has been found that beekeeping households grew and conserved more plants for economic uses than households that were not engaged in beekeeping.
- Establishing exclosures enhances the potential for honey production in Ethiopia. In Amhara, the potential for production can be increased considerably, given that the region has approximately 5.8 Mha of degraded lands. Approximately 11% of the region has a slope greater than 30%. A considerable number of other districts have beekeeping potential too. For example, of the 638 districts in Ethiopia, approximately 262 (41.1%) are suitable for beekeeping.
- Communities and households could invest in planting vegetation preferred by bees in exclosures established on degraded landscapes. For instance, exclosures in Tigray have supported successful regeneration of one of the most important honeybee flora, *Hypoestes forskaolii* (Vahl).

- *Source:* Mekuria et al. 2020

Box 4. Suitability of Exclosures for Cultivating Forage for Livestock Fattening

- Cattle production is an integral part of mixed crop-livestock farming, agropastoral and pastoral production systems in Ethiopia. The livestock subsector contributes 12% and 33% to Ethiopia's overall GDP and agricultural GDP, respectively. It also accounts for 12-15% of total export earnings (second only to coffee), and contributes to the livelihoods of 65% of the population.
- However, there are numerous constraints to livestock production in Ethiopia, which prevent supply from fulfilling demand in both domestic and international markets. Among these constraints, the lack of adequate livestock feed is a major problem. Livestock fattening practices in Ethiopia are based on three systems: traditional, byproduct-based, and cut-and-carry feeding of individually tethered animals. All three systems depend on locally available feed resources, including grasses, natural pasture, crop residue, hay, etc.
- Exclosures can help support livestock fattening by providing space to increase the quantity and quality of feed. They can also contribute to conserving soil moisture and recharging groundwater, both of which are important for livestock feed production.
- About one-third of the land in Ethiopia is suitable for practising livestock fattening (cattle, sheep and goat fattening and dairy production) with improved feed, suggesting that there is potential for integrating forage production in exclosures. That is a win-win situation for everybody.

- *Source:* Mekuria et al. 2020

Box 5. Suitability of Exclosures for High-value Crops

- Tree and plant species can benefit both environment and ecosystem services while also delivering economic returns. High-value plant species are sources of food and feed, and provide inputs for industrial products including, for example, fruit trees and cosmetic or medicinal plants such as moringa.
- Ethiopia has a comparative advantage in the production of horticulture commodities, such as fruits, due to its suitable climate, availability of adequate water (the country's groundwater potential varies between 2.6 and 13.5 billion cubic meters [BCM] per year).
- Exclosures can be used to increase production of high-value fruit species. It would ease grazing pressure, contribute to recharge of groundwater, improve soil moisture content and moderate local climate. This in turn would increase the potential for fruit production, especially when soil and water conservation (SWC) structures such as terraces, trenches, bunds and micro-basins are built.
- Experience from the Amhara, Tigray and Oromia regions shows that farmers are producing high-value irrigated crops and fruits in a watershed where exclosures have been established (Gebregziabher et al. 2016).
- Cultivating fruit species in exclosures will have multiple benefits, such as diversifying local livelihoods, producing high-quality fruits for local and export markets, stabilizing SWC structures and, ultimately, ensuring that exclosures are sustainable by increasing the short-term economic benefits they deliver.

- *Source:* Mekuria et al. 2020

3.1.2. Environmental Sustainability

Environmental sustainability has been defined (Morelli 2011) as the quality of "meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them." In the business model, this component focuses on the contributions different income-generating activities can make to improve and sustain the ecological benefits of exclosures while also enhancing livelihoods over time. The sustainability component also assesses the contribution of the revenue streams in terms of adaptation to climate change or variability. Further, it investigates the local community's perception of the benefits and drawbacks that might result from the

establishment of an exclosure. Finally, this component analyzes the factors and preconditions needed to make the various revenue streams enhance and sustain ecosystem services (Mekuria et al. 2020).

Using exclosures for income-generating activities can help us in improving ecosystem services, which include: (i) provisioning services, (ii) regulating services, (iii) supporting services, and (iv) cultural services. Mekuria et al. (2020) indicated that integrating beekeeping and livestock fattening activities and cultivation of high-value crops within exclosures helps improve diverse ecosystem services (Figure 7).

Figure 1. Theb enefitso fi ntegratingr evenue streamsw ithe xclosuresi nt erms of improvemento f ecosystem services.

Group Discussion

Do you agree that integrating beekeeping with exclosures plays a significant role in increasing agricultural productivity? If yes, how? If no, why? Discuss it in a group and present it to all groups.

3.1.3. Governance, Policy and Regulatory Context

The Government of Ethiopia has increased its focus on sustainable environmental management and development in recent years. This is reflected in the adoption of various policies, strategies and proclamations related to agriculture, environment, natural resources and sustainable development. These policies include:
(i) Rural Development Policy and Strategies (RDPS, 2003)
(ii) Environmental Policy of Ethiopia (1997)
(iii) Forest Development, Conservation and Utilization Policy (2007)
(iv) Water Sector Policy (2001)
The regulatory approaches include
(i) Climate Resilient Green Economy (2011)
(ii) Conservation Strategy of Ethiopia (CSE, 1994)
(iii) Rural Land Administration and Land Use Proclamation (No. 456/2005)
(iv) Proclamation on Institutional Arrangement for Environmental Protection (No. 295/2002)
Ethiopia emphasizes establishment and management of exclosures within the national agricultural, environmental and natural resources policy framework. Therefore, this component of business model development focuses on analyzing how proposals for sustainable land restoration should align with the existing policies.

Question for Group Discussion
- Mention some of the policies you are familiar with and share them with other groups.
- How are these policies an opportunity for the application of livelihood strategies to exclosure management?

3.1.4. Gender Considerations

The roles men and women play in society have similarities and differences across classes and societies. Since the definition of these roles is specific to space and time, gender divisions cannot be checked off from a list. Gender differences affect the distribution of resources between men and women, and are shaped by ideological, religious, ethnic, economic and social determinants. Being socially rather than innately determined, this distribution can be changed through conscious social action, including public policy. Gender issues are central to the attainment of development goals and poverty reduction. They have a prominent place among the United Nations Sustainable Development Goals (SDGs), which have been commonly accepted as a framework for measuring development progress.

Assuming a supportive economic infrastructure, there is high potential for women to benefit from exclosures. The number of women engaged in honey production in Ethiopia is growing (Belayhun 2014). For example, following interventions by the Oxfam project in the Amhara Regional State from 2009 to 2011, the number of female members of cooperatives increased by 25%, and women now account for 17% of the total membership in the region. Women are often responsible for fodder markets in Ethiopia. Developing a cut-and-carry system in exclosures presents an opportunity for women to increase their involvement in the fodder trade. Women are also often responsible for animal products such as milk. So improved feed could increase milk supply, benefiting women's income. Women may also have a role to play in planting and harvesting high-value plant species, because rural women depend heavily on home-garden agroforestry systems for their family livelihoods (Gabiso et al. 2015).

However, policies supporting the establishment of exclosures have not yet addressed the different needs and priorities of men and women in exclosure management. Both policies and institutions have to be gender responsive to ensure that women as well as men equally reap the benefits of exclosures. In general, women may benefit from some activities but they tend to lack the power and status to access all the benefits available. At the local level, involvement of women in decision-making on the use and management of exclosures has been limited, largely because they have little or no representation in the watershed development committees (Mekuria et al. 2017). Men, at informal all-male get-togethers, take most decisions, which constrains the involvement of women in decision-making (Yami et al. 2013). Nedessa et al. (2005) found that a patriarchal culture and the lack of representation of women resulted in a gender imbalance in all aspects of exclosure management.

Financial policies lack mechanisms to enhance gender inclusiveness, let alone empowerment. The government and donors have long supported microfinance institutions (MFIs) so as to resolve the credit access problems of the poor. The outreach of services provided by MFIs increased by 22.9% from 2003 to 2007 but access by disadvantaged people, particularly women, remains limited; women comprise only 38% of the borrowers (Kereta 2007). The International Fund for Agricultural Development (IFAD 2001) has highlighted that the proportion of women clients supported by rural-based government-supported MFIs is less than half of all their clients.

Group Discussion

- Why does gender matter?
- Give some examples of gender-differentiated roles in exclosure management.
- How could women benefit from improved income streams from exclosures?

3.2. Developing Business Models for Solar Pump-based Irrigation

This section presents the analyses carried out for mapping the suitability of solar energy-based irrigation pumps and developing economically viable business models.

3.2.1. Suitability Mapping

Constraint Analysis for Identification of Unsuitable Areas. In the first step of the process, constraint factors are analyzed to exclude unsuitable areas. Table 5 presents the constraint factors and the range of values used (Otoo et al. 2018).

Table 5. Constraint analysis for solar pump-based irrigation business models.

Constraint factor	Range of values within the constraint factor
Protected areas	National parks, wildlife conservation areas (sanctuary), forests, wetlands, lakes, dams
Land cover L	and cover other than agriculture, grassland, shrubland and bare land
Elevation	Elevation below 500 meters above sea level (masl) and higher than 3,200 masl
Rainfall A	nnual precipitation lower than 900 mm
Depth to bedrock D	epth to bedrock < 30 cm
Slope S	lope greater than 8%
Irradiation R	egions with solar irradiation lower than 1,300 kWh $m^{-2}y^{-1}$
Groundwater depth G	roundwater depth of 7 m, with 25 m as maximum limit
Groundwater storage L	ow groundwater storage
Aquifer productivity	Less than 0.1 liters per second

Reclassification and Suitability Analysis. This second step in the process of suitability mapping involves four scenarios as presented in Table 6.

Table 6. Scenarios for reclassification and suitability analysis.

Data	Groundwater		Surface water	Groundwater and surface water	
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	
				a	b
Solar irradiation (KWh m^{-2})	✓	✓	✓	✓	✓
Slope (%)	✓	✓	✓	✓	✓
Distance to roads (m)[a]	✓	✓	✓	✓	✓
Groundwater depth (0-7 m) I		✓		✓	
Groundwater depth (0-7, 7.1-25 m) II	✓				✓
Aquifer productivity (liters/second)	✓	✓		✓	✓
Groundwater storage (mm)	✓	✓		✓	✓
Proximity to river (m)			✓	✓	✓
Proximity to small reservoirs			✓	✓	✓
Proximity to town (population-dependent)[b]	✓	✓	✓	✓	✓

3.2.2. Environmental Sustainability

Determining the environmental sustainability of intensifying irrigation using solar pumps requires an assessment of the available water resources, both in terms of quality and quantity. It also requires the identification of indicators to determine whether water resources could be negatively impacted beyond an acceptable threshold. Increasing the use of water for sustainable intensification of smallholder agriculture can have different and undesirable impacts at the farm and landscape scales. It can affect the basin environment and ecosystem services. These impacts need to be understood in relation to each business model, since the potential for scaling varies and each agroecology has different opportunities to mitigate or absorb changes.

This section discusses four environmental factors related to solar pump irrigation development: (i) water quantity, (ii) greenhouse gas (GHG) emissions, (iii) nutrient management and salinity and (iv) intensified agrochemical use in relation to water quality and biodiversity. Local and national stakeholders should consider any unintended negative environmental impacts of the model alongside social and economic gains, and in relation to policies and laws.

The suitability assessment presented in the above section on suitability mapping used distance to rivers, depth of groundwater and aquifer productivity and storage and soil depth to identify suitable locations for solar pump usage. However, this does not consider other water use requirements or groundwater recharge estimates. It is important to quantify the water needed for other activities (e.g., drinking water, sanitation, industry) and recharge estimates to prevent overextraction of groundwater for agriculture. This would help to define the maximum land area and the number of solar pumps in a specific location to ensure that the extracted groundwater does not exceed the sustainable threshold.

The development of solar pump irrigation can affect landscape water withdrawals for other uses and undermine water flows, storage and recharge, depending on local agro-hydrometeorological conditions and the number of pump users.

From an environmental perspective in Ethiopia, there is significant scope for smallholder irrigation development to sustainably improve production, productivity and income. Most notably, solar pump irrigation offers the environmental benefit of mitigating agricultural GHG emissions and can thereby contribute to cleaner, mechanized smallholder farming systems. The other three environmental aspects—water quantity, nutrient management and salinity, and intensified agrochemical use in relation to water quality and biodiversity—apply to scaling of irrigation more generally.

As a precautionary principle, measures should be taken to avoid or mitigate unintended negative impacts. Such measures can be outlined as follows:

- Introduce irrigation management tools and practices to smallholder farmers alongside solar pumps to reduce the risk of inefficient water abstraction and nutrient leaching.
- Ensure that women and men farmers have equitable and extensive access to the best knowledge and practices in fertilizer and agrochemical use to support efficient and effective conservation practices in sustainable intensification.
- Invest in collecting data on irrigation and environmental impacts within an overall monitoring and evaluation framework with clear guidance to support policy around sustainable intensification of solar pump irrigation, and in particular, around quantity appropriation, water quality, biodiversity and land sparing at the watershed scale.

3.2.3. Governance, Policy and Regulatory Context

Adoption and spread of solar pump irrigation in Ethiopia must occur within the applicable institutional and regulatory environment. Several policies, strategies, regulatory instruments and laws are relevant to solar pump investments. The Ethiopian Government's commitment to increasing irrigation is accompanied by complementary policies and initiatives. The national ministries have overall responsibility for land, water resources, agriculture and irrigation, but the regional states administer land and related resources within their boundaries. In 1975, the government reformed land rights, and currently the country's land policy is enshrined in Article 40 of the Constitution, according to which ownership is vested in the state and held by the people. The state acquires and redistributes agricultural land to people who wish to farm. Officially, land cannot be sold, exchanged, or mortgaged, but farmers enter into rental agreements, notably in irrigated areas. However, landholdings are small: about 55.7% of farming households cultivate less than 0.5 ha and the average holding is 0.81 ha.

Module 4

Value Chains, Finance and Economic Viability of Restoration Measures

Module Objective

At the end of this training module, you should be able to:

- Describe the important concepts, principles and importance of value chains
- Discuss the challenges and opportunities of value chain development
- Map different agricultural value chains
- Describe the different value chain development interventions or strategies
- Discuss the implementation, monitoring and evaluation of value chain devel-opment strategies
- Assess the economic viability of restoration measures

4.1. Value Chain Basics

This session presents key terms, concepts and principles of the value chain. Particularly, it focuses on value and value addition, value chain and value chain maps, and other related terms and concepts.

Value. In the value chain concept or in business, value is defined as the price buyers are willing to pay for what a firm provides (Porter 1985). Value is a subjective experience that is dependent on context. In the context of a waiter clearing a table, for example, a glass of water standing there has no value, or even negative value—it's just more work for him. But for a thirsty man, that same glass of water is extremely valuable. Therefore, value, like beauty, is in the eye of the beholder. Value has meaning in a number of contexts, including trading relationships, consumer purchases, and the interests of company shareholders. Also, value occurs when needs are met through the provision of products, resources or services, usually by way of a transaction or exchange. In general, it is an experience that flows from the person (or institution) who is the recipient of resources as customer.

Three forms of value occur in business-to-business commercial transactions.

- Technical (Resource Value). This is intrinsic to the resource being provided, and occurs in virtually all exchanges. For the thirsty man in the example above, the water in the glass has a technical value regardless of the source, or any other consideration. The glass may be dirty, or the man providing it hostile, but the water will still have the same technical value.
- Organizational (Business Context). This form of value is built upon the context of the exchange and may derive from a range of factors such as ethical standards, prestige, reliability and association. Brand image may build organizational value, as well as company reputation. For example, at a fine dining establishment, the label on the water bottle generates value far in excess of the bottle's content.

• Personal (Career and Idiosyncratic). This value is derived from the personal experiences and relationships involved in the exchange of resources and the benefits provided. While technical or organizational value accrues to the small producers and smallholder farmers involved in a commercial exchange, personal value accrues to the individual. Manager mo-tivation, preferences, feelings of comfort and trust create value for individuals that engage in trading relationships on behalf of small producers and smallholder farmers and can be extremely influential in the determination of successful exchange.
At the consumer level of exchange, value is layered. It is represented by three concentric rings as shown in Figure 8.

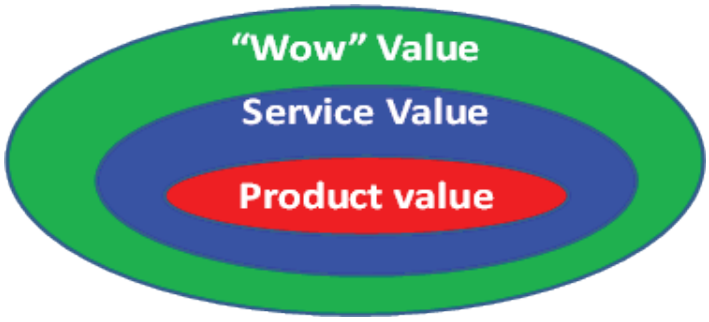


Figure 8. The three layers of value represented by concentric rings.

• In the central ring is product value, the technical value derived from providing a source of supply.
• The middle ring of service value is provided by the services that surround the product such as personal care and warranty service.
• The outer ring has been called 'wow value', the new service/quality battleground. This third level of value is achieved by providing enhanced service, to "make your customer successful" rather than just satisfied. At this level, the experience surrounding the ex-change of resources provides its own unique 'wow value', and the product itself is sec-ondary.

Value Addition. This refers to creating one or more of the above values. Value-added products are items that have been changed or transformed from their original state as an agricultural commodity. The process of changing the commodity inherently adds value to it as it becomes more usable for the consumer. Examples of value-added agriculture products include:
• wheat that has been milled into flour.
• strawberries made into jam.
• organic cotton marketed to a specific group of people that place a high value on organic qualities.
• herbs that are dried, mixed and packaged for convenient use in cooking; and field corn that is fed to livestock, which is then transformed into meat.

Value Chain and Value Chain Maps. The value chain concept was developed and popularized in 1985 by Michael Porter in Competitive Advantage, a seminal work on the implementation of competitive strategy to achieve superior business performance. He conceived the value chain as a combination of nine generic value-added activities operating within a firm. As the name implies, the primary focus in a value chain is on the benefits that accrue to customers, the interdependent processes that generate value, and the resulting demand and fund flows that are created. Figure 9 presents the interaction between value and supply chain. Table 7 presents definitions of the value chain and value chain maps.

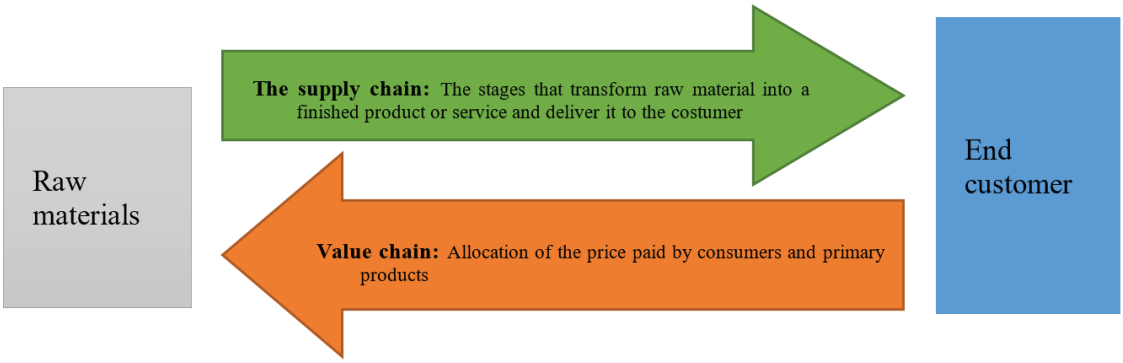


Figure 9. The supply chain and value chain interaction.

In Ethiopia, Integrated Agro-Industrial Parks (IAIPs) are exclusively focused on agricultural raw materials. These firms have the mandate of linking agriculture with industry. Commodities pass through Rural Transformation Centers (RTCs) and collection as well as aggregation centers on the way to final processing. By aggregating produce from several farms at one location, the IAIPs and RTCs serve the function of linking smallholder farmers to large agricultural value chains. Such linkages serve two key functions: (1) integrating raw material suppliers (smallholder farmers) with the demand side of the food chain in an efficient manner; and (2) providing appropriate raw materials to agro-industries (thus overcoming a major constraint affecting food processors in Ethiopia). This is essential for poverty reduction in the rural areas and for structural transformation of the economy. If this process can be linked up with business models operating in area exclosures like beekeeping, irrigated agriculture and livestock fattening, it would serve to provide a reliable raw material supply right along the value chain (Figure 10).

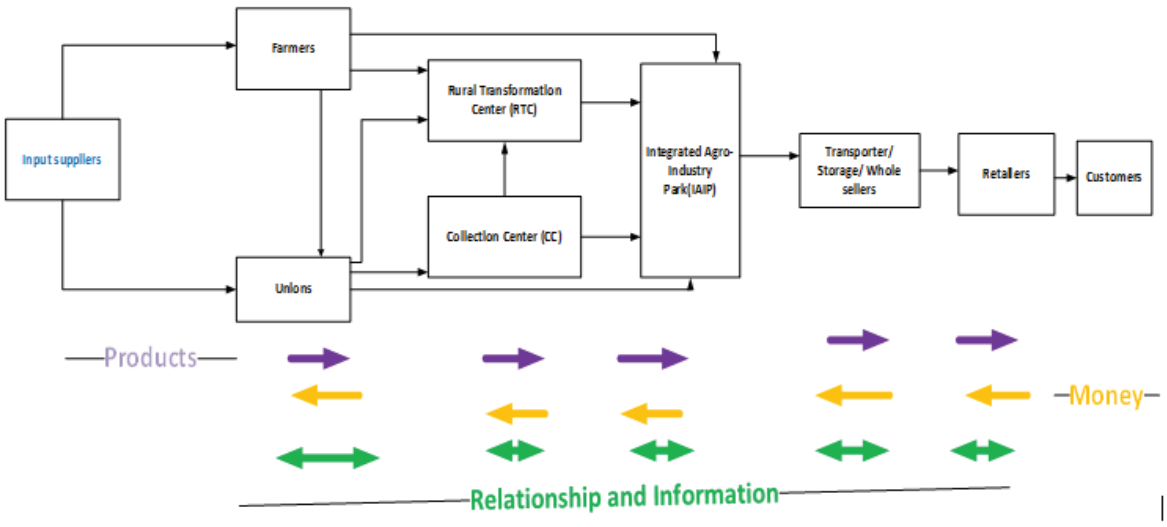


Figure 10. A generic model of Ethiopia's Integrated Agri-Industry Park value chain.

Table 7. Definition of the value chain and value chain maps.

Value chain (VC) definition	Value chain maps
• VC describes the full range of activities required to b ring a p roduct o r service from c onception, through different phases of production (involving a combination of p hysical transformation a nd input of various producer services), to delivery to the final consumer and final disposal after use.	• Value addition in different phases of production c an be m apped on a v alue c hain map for easy understanding. The map depicts the links between successive stages in the value chain. • As markets develop, v alue c hains become m ore complex with m ore competing channels f or b oth

- The value chain has a different focus and larger scope than the supply chain, which is simply the transfer of a commodity from one stakeholder to another in a chained manner.
- Value chain analysis looks at every step of the process, from raw material to eventual end-user, right down to the disposal of the packaging after use.
- The goal is to deliver maximum value to the end-user for the least possible total cost.
- That makes supply chain management a subset of value-chain analysis.
- Value chains play an important role in transforming agricultural commodities from raw material to end products demanded by customers.

inputs and outputs.

- A wider range of participants from smallholder farmers to transnational retailers with a wide range of technologies (from small-scale juice vendors to large sugar manufacturing plants) participate in value chains.
- Understanding the value chain is important as it explores why farmers choose to buy a particular input (such as a type of seed) given the institutional and market infrastructure and demand.
- Value chain maps are useful for understanding actions throughout the value chain.
- The market map is an analytical tool that helps in understanding policy issues that affect the functioning of the chain and also the institutions and organizations providing the services (e.g., market information, quality standards) that different actors in the chain need in order to make informed decisions.

An agricultural value chain can promote enterprises that are involved in a limited range of crops and so face a more concentrated set of risks due to uncertainties. Therefore, a value chain is a coordinated effort of players who act strategically while the important principles of value chain including promoting competitiveness, improving collaboration and building trust are met. Table 8 presents the key features of agriculture-based business value chains.

Table 8. Types of agriculture-based business value chains.

Model	Drivers	Motivation
Producer-driven	Smallholder groups, associations, cooperatives, unions	Access to new markets, access to inputs, secure market position, farmer empowerment.
Buyer-driven	Processors, retailers, exporters, traders, wholesalers	Access to land, supplies, increase in volumes, supply niche markets.
Intermediary-driven	NGOs, development agencies, governments	Local and national economic development, farmer empowerment.

We summarize the stages of an agriculture-based value chain, and its actors and activities—producers, collectors, processors, marketers and consumers—in Table 9.

Table 9. Actors and activities in the agricultural product value chain.

Stage	Actors	Activities
Production	Input supplier	Seed suppliers, livestock breeders, fertilizer suppliers, researchers and propagators provide production inputs directly or indirectly through traders or other/intermediaries
	Primary producers	Primary producers/growers comprising farmers and livestock keepers
Logistics	Aggregators (small and large)	Role in bringing commercial value to the producer
	Transport and packaging	Movement of products from farm gate to large aggregators/processors, etc.
	Warehouses, cold storages	Warehouse/cold storages improve the shelf life of products and aid price realization at the producer's level
Processing	Primary processors	Processing by millers/factories involve two stages of value addition
	Final processors	After initial processing, physical form of produce is changed. In further manufacturing, the initially processed produce undergoes a higher value transformation to become the end product for consumers.
Marketing	Wholesalers Exporters	Marketing and distribution of products by wholesalers, exporters and retailers after purchasing (raw or processed) products from producers, initial processors or food manufacturers
	Organized retailers Small retailers	Traders who serve as intermediaries between producers/assemblers/processors and large distributors

Question for Group Discussion

a) Why are area exclosures included in the value addition process? What is their contribution to or link with value addition?
b) Is there any possibility or opportunity of adding value to the products or services generat-ed by exclosures?

Value chains with different revenue systems—beekeeping, livestock fattening, fruit production and solar-powered irrigation—are discussed below to illustrate the interactions in and complexity of value chains in the agriculture sector.

Value Chain of Beekeeping. According to a study by Ethiopia's Ministry of Agriculture and the International Livestock Research Institute (2013), beekeepers, honey and beeswax collectors, retailers, Tej (a kind of honey wine made in Ethiopia) brewers, processors and exporters are key actors in the honey value chain (Figure 11). The study identified three principal channels in the value chain: Tej brewing, honey processing and exporting (to neighboring countries and Dubai), and beeswax production. Dong et al. (2016) classified the honey market in Ethiopia into different categories based on end use of honey. Both the studies named above demonstrated that the marketing of honey is complex and interconnected but lacking organized marketing channels and formal links among the actors. Development of market linkages therefore could increase the amount of honey available for sale.

Three principal channels have been identified in the honey value chain: Tej brewing, honey processing and exporting, and beeswax. Most of the harvested honey goes through the Tej brewing channel. Beekeepers sell their honey to local collectors (dealers or cooperatives) at the district or zonal level. It is directly delivered to Tej brewery houses in the locality and/or transported to big honey dealers (verandahs) for supply to breweries in Addis Ababa. Some beekeepers who produce large quantities do directly supply to Tej houses in their area. Although economically not significant, Tej is informally exported through transiting visitors. In 2019, on the TV reality show Shark Tank, an investor pitched Tej as a high-value honey wine product and started selling it to the Ethiopian diaspora in some states of the USA.

Supply of several inputs for beekeeping, especially bee forage, colony beeswax, protective clothing and beekeeping accessories, is at a rudimentary stage. Well-built hives, frames, foundation combs, centrifuges and other hive management equipment are expensive and not widely available. A review of previous assessments revealed that there is inadequate support from extension services for beekeeping and that there is a lack of training material and guidance for beekeepers, processors and traders. Also, there are no appropriate demonstration sites and extension packages. Apiculture extension services are not well organized and they lack a strategic approach and coordination.

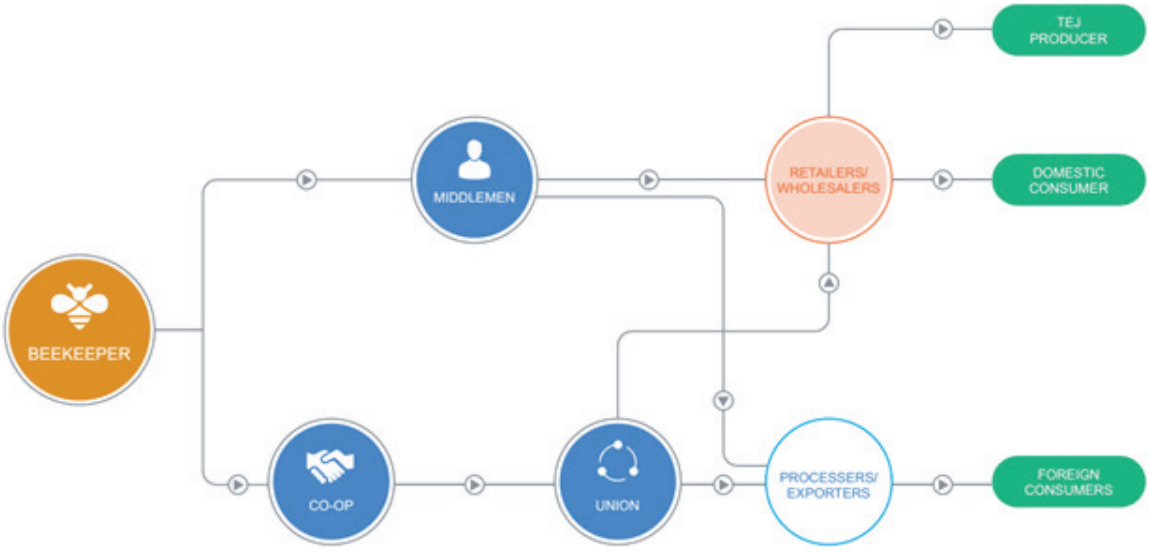


Figure 11. Ethiopia's honey value chain.

Livestock and Fodder Value Chain. The livestock market in Ethiopia has a three-tier system: traders, including butchers, meat-processing factories, fattening farms or live animal exporters procure livestock in primary (where the main sellers are producers), secondary (regional—where the main sellers are traders) or terminal (national—where the main sellers are traders) markets. Prices are usually determined through individual bargaining, and depend mainly on supply and demand. They are heavily influenced by the season, and the proximity of religious and cultural festivals (Alemayehu 2016). For example, prices of cattle are highest from February to June (reaching a peak of USD 800) and lowest from September to January (USD 500).

Ethiopian meat and live animal value chains have developed over a long period and are highly complex (AGP-LMD 2013). The key actors are producers, collectors (i.e., individual traders based in rural areas), small private and cooperative fatteners/feedlots, middlemen, cooperatives for livestock trading, individual traders, exporters and consumers. Halala (2015) demonstrated that the linkages among the different actors in this value chain are neither sustained nor reliable. The study showed that most of the relationships are casual and often change with the circumstances; and the actors tend to ignore standard business principles.

Other studies (e.g., Gebremedhin et al. 2009; Dejene et al. 2014) point to several actors in the feed markets, including both subsistence and market-oriented rural farmers, urban dairy producers and fatteners, commercial poultry producers, livestock and poultry traders, feed processors, abattoir operators, live animal exporters and feed exporters. Most feed trading is informal and conducted without licenses. There seem to be few barriers to entry and exit, with traders exiting the business at will and new traders getting in. However, licensed businesses, which are usually large, tend to stay in the business over time.

Fruit Production Value Chain. There are many actors along the lengthy fresh fruit value chain, without significant value addition at every point (Worako 2015). An efficient marketing system is crucial for sustainable fruit production and to ensure a continuous supply to the markets (Nega et al. 2015). There are at least three supply chains for horticultural products: domestic, regional and European (EIA 2012). Both government enterprises and private exporters are engaged in the export of fruits.

Solar Powered Water Pump Value Chain. There is great potential in using solar pumps to address the challenge of farmers' limited access to water for dry-season irrigation. This value chain includes private enterprise (i.e., a farmer) that invests in a solar irrigation pump to achieve higher agricultural production and earn more profit (Figure 12). In addition to generating income from crop sales, farmers can consider selling excess water to neighboring farmers. Rural MFIs seem to be the most suitable financiers/credit sources for farmers seeking to invest in individual irrigation technologies. Suppliers of solar irrigation pumps are also one of the value chain actors who can also provide alternative avenues of financing directly to farmers (Otoo et al. 2018).

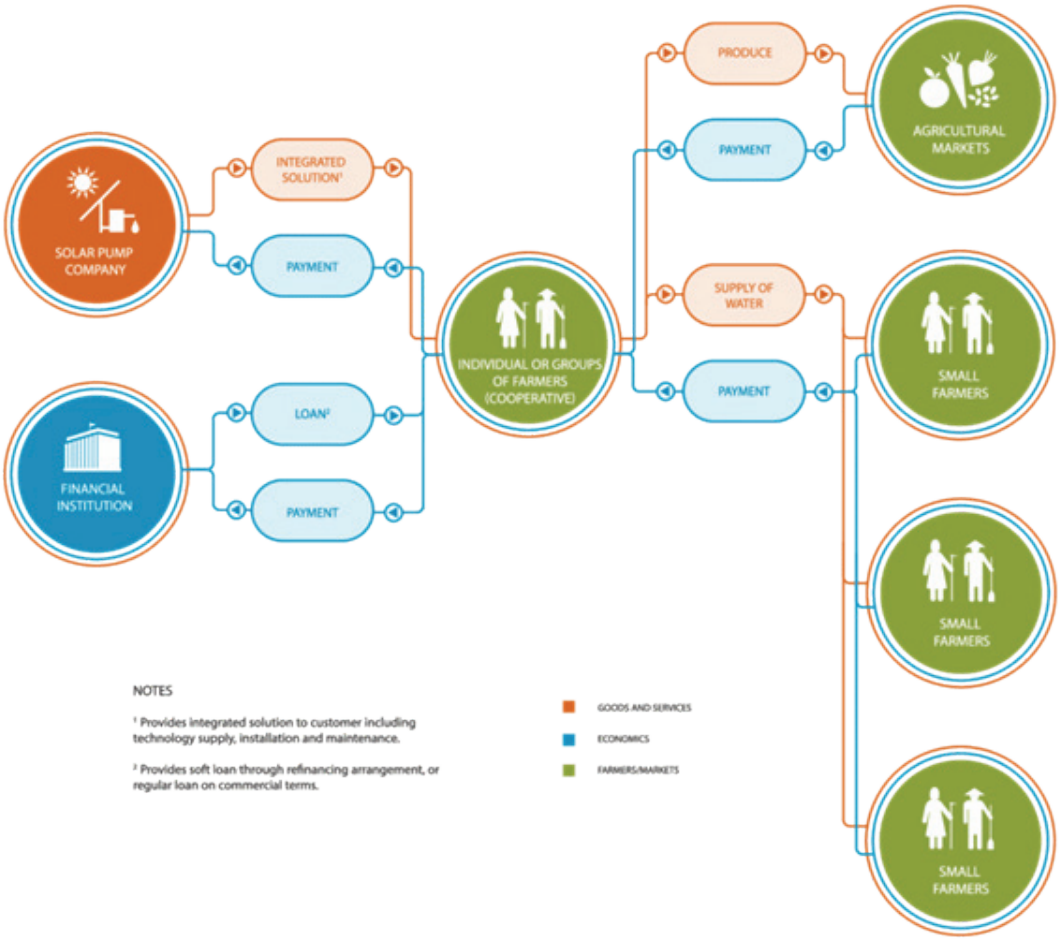


Figure 12. Value chain map for solar-powered irrigation.

Value Coalitions. Often, a single work process can concurrently involve several units in the value chain and might be more accurately thought of as a value coalition. The value coalition model recognizes that value is often created by the simultaneous interaction of several stakeholders. In Figure 13 below, Research and Development, Marketing, Production and Customers are all viewed as working together to add value. Problems arising in a value coalition model thus involve several units and require their simultaneous participation to find solutions.

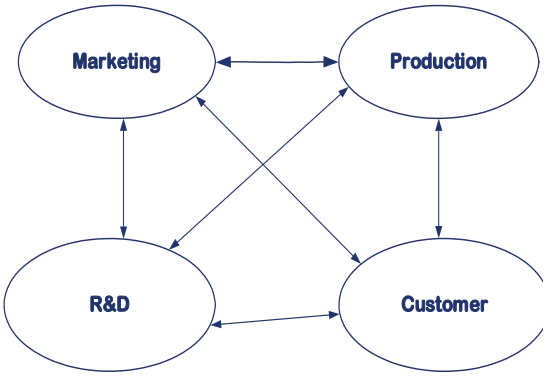


Figure 13. A value coalition of research and development (R&D), marketing, production and customers.

Question for Group Discussion
i. How do you define value and adding value from the perspective of bee products?
ii. What are the value chains in bee products and what are the components?
iii. What needs to be separately done by decision-makers for chain components especially to address problems?

4.1.2 Business Networking
Networking. This means combining talents and resources for joint/mutual cooperative development. It involves "a group of interconnected people who interact to exchange information and develop professional and social contacts and relationships." Hence, "networking is all about the relationships" built upon mutual benefit and awareness of common interest (Figure 14).

Figure 14. The relationship processes of networking adapted from the Kolb learning cycle mod-el.

Generally, in networking:
• The participants are able to achieve a collective efficiency and conquer markets beyond their individual reach.
• Informal (soft) and formal (hard) communications should be managed and documented ap-propriately.
o Soft networks usually encompass a larger number of firms than hard networks.
o Hard networks are much more commercially focused, and involve a limited number of pre-selected firms, sometimes formally and tightly linked through a joint ven-ture/strategic alliance.
In a business area, entrepreneurs can answer "why the business exists", and it is easy to explain: they cannot do things alone. The difficult part is the "how" to do it efficiently and effectively. So the following points are important for doing things effectively and efficiently:
• Define the priorities for your network.
• Monitor your contacts and select the trusted contacts.
• Keep in contact with the selected ones.
• Cut out the not-so-productive contacts.
• Aim at personal contact in the network.
It is not the number of contacts in your database that counts, but their quality and trustworthiness.

ICT Tools for Networking. These tools include e-mail and online social networking services

such as Telegram, LinkedIn, Twitter and Facebook which provide platforms for social and business relations and make it possible to connect people who share interests and activities across political, economic, and geographic borders.

Since businesses operate globally, social networks can make it easier to keep in touch with contacts around the world. For example, LinkedIn has over 100 million users in over 200 countries. Businesses can use social media:
- To create brand awareness
- As an online reputation management tool
- For recruitment
- To learn about new technologies and competitors, and
- As a lead generation tool to intercept potential prospects.

Question for Group Discussion

1. Define what networking is.
2. Discuss soft and hard networking by giving examples from agriculture-based businesses.
3. What is the importance of ICT tools for networking?

4.2. Financial Feasibility Analysis

The major question to ask while designing a business model is: How can you check the feasibility of the business idea? In fact, you have to answer three questions from different perspectives to check whether the business model is feasible:
- Can I build it? Can I provide the service to deliver the values I am proposing?
- Are customers willing to buy?
- Can I sell at a price that will cover my costs?

Only if you answer 'yes' to all three questions can you say your business idea/scenario is feasible. You should be able to say "my business model is feasible" with a valid argument explaining why. In fact, you have to go around and ask people what they really think about your product or service offer. And then you have to check whether you can access the material you need. How much would it cost to build a beehive/animal shade/nursery shade, and how much of

your product or service would you be able to sell?
This involves three steps:

- Step 1: Preparation—What do you need to know and how can you find out?
- Step 2: Go and ask the right people for opinions and prices, etc.
- Step 3: Analyze the data and calculate if it makes sense.

In case it does not make sense, try to see how to redefine your business model to make it more realistic and start over again. If it makes sense, use the information to further improve your business model and prototype. After knowing what consumers think and what materials are available, there will always be something you can do better.

Step One: Preparation. The first step requires you to answer three questions:

A. "Can I build it?" What do you need to know to be able to answer this question? You need to know what materials you will require to build your prototype. You must find out where you can buy those materials and how much they cost. Prototyping is a good starting point to idealize the nature of the business scenario on paper.

You should think about what you can do yourself in the building process and whether or not you have the knowledge and skills for it. Or can you obtain the missing knowledge or skills through third parties? What are the costs?

B. "Are existing customers willing to buy this?" To answer this question, it is important to know who your customer is: How old is he/she? What are his/her education and income levels? Where will you find him/her? You will also have to figure out whether he/she likes your product and is really willing to pay for it. How much?

You should definitely also consider the alternative products/services available to the customer. Are there any competitors who sell similar things? If yes, for how much? What is different about them? How much more is a consumer willing to pay for your solution? Alternatively, will he/she accept a cheaper solution? What advantages can you generate? Will they have value for the customer?

C. "Can I sell at a price that covers my costs?" After collecting the data needed to answer the above questions, you will have to identify what further costs may arise and at what price you can sell your product to make a profit. For this analysis, some basic financial terms you need to know are 'needed investment', 'breakeven point', 'trade margin', 'costs,' 'sales,' 'profit' and 'return on investment' (Figure 15).

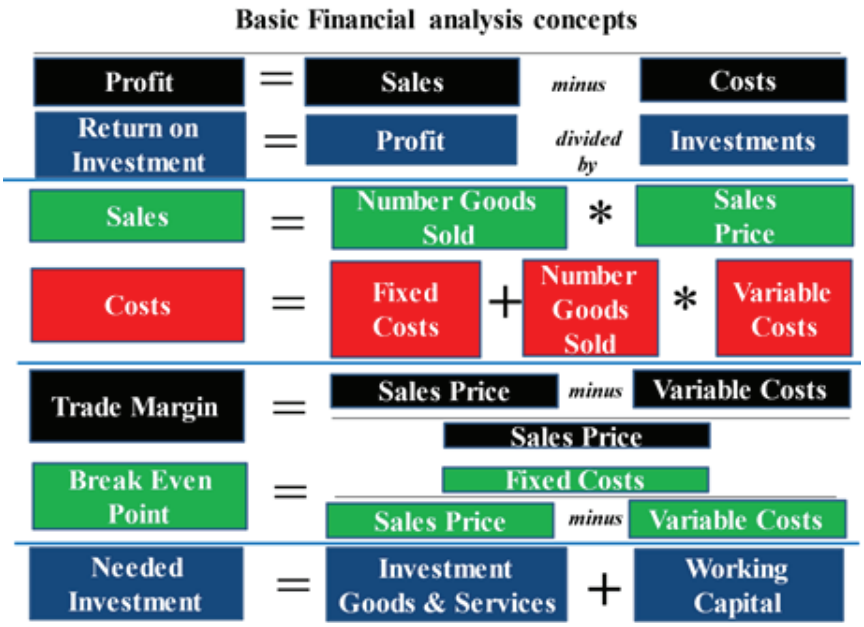


Figure 15. The basic concepts of financial analysis.

To answer the most important question, whether or not your business makes sense, see if you generate a profit from the business. To make a profit, sales have to be higher than costs. The term 'profit' can be understood differently in social, financial and economic perspectives. Your ultimate aim may be to maximize benefit for the community and the households in it through exclosures and solar water pumps.

Additionally, you also have to calculate the return on your investment. If your beekeeping business makes a profit of ETB 10,000 per month, it may look attractive and profitable. But in relation to the money you invested in it, it might look different. Let us assume you have to invest ETB 12,000,000 to make such a profit. That would mean you would achieve a yearly return of (12*10,000 =120,000)/12,000,000 = 1%. This is a small return; it does not beat inflation (a general price increase of different goods and services over a specified period of time). The decrease in your ETB purchasing power will be higher. This is from the financial perspective of an individual. It might seem different if we see it from the perspective of long-term benefit to society. So, to judge whether your business makes sense, you have to look at profit as well as return on investment. And to calculate profit and return, you have to consider different kinds of costs (Figure 15).

The three major kinds of costs to be considered are variable (direct), fixed (indirect) and investment costs. Let us start with the differentiation of fixed and variable costs, which are the costs necessary to calculate your profit and profit-related key numbers.

As your sales depend on the number of goods you sell, your variable costs depend on production and sale of goods. Imagine you have a simple trading business of buying a product and selling it onward. Then the costs of buying the product are your variable costs.
Example. Assume that you aim to sell 10 solar-powered water pumps. You have to first buy 10 solar-powered water pumps. Assuming that your purchase price is ETB 9,000 and your selling price is ETB 10,000, calculate the total revenue (sales) and profit that you expect to earn.
To calculate the total revenue and profit we have the necessary information, i.e., price information for the inputs purchased and price information for the output.
Total revenue is calculated as (Figure 15)
Total revenue (TR)=Number of goods sold×selling price
TR=10 units×10,000 ETB =100,000 ETB
Total profit is calculated as
Profit (P)=Total revenue (TR)-Total cost (TC)
Before calculating the profit, we need to calculate the total cost as follows:
Total cost=Total fixed cost (TFC)+Total variable cost (TVC)
But we only have a total variable cost. It is calculated as
Total variable cost (TVC)=Number of solar-powered water pumps purchased×purchase price
TVC=10 units*9,000 ETB = 90,000 ETB
Total cost=0+90,000 ETB = 90,000ETB

Therefore, your profit would be:
Profit (P)=100,000 ETB-90,000 ETB = 10,000 ETB
If you increase your sales to 20 pumps, your costs will increase at the same time by x10 and the profit would be ETB 20,000. Here we can add a time projection for the period of time we want to operate this business. With the help of an Excel spread sheet, things would be much easier (Figure 16).

Example. Assume you have sold 20 solar-powered water pumps. (You have to buy 20 solar-powered water pumps first.) Assuming your purchase price is ETB 9,000 and your selling price is ETB 10,000, find the total revenue (sales) and profit that you expect to earn. But now add a fixed cost of ETB 1,000 per month for the rent of your store. Table 10 presents more details on this.

Table 10. Estimating the profitability of a business.

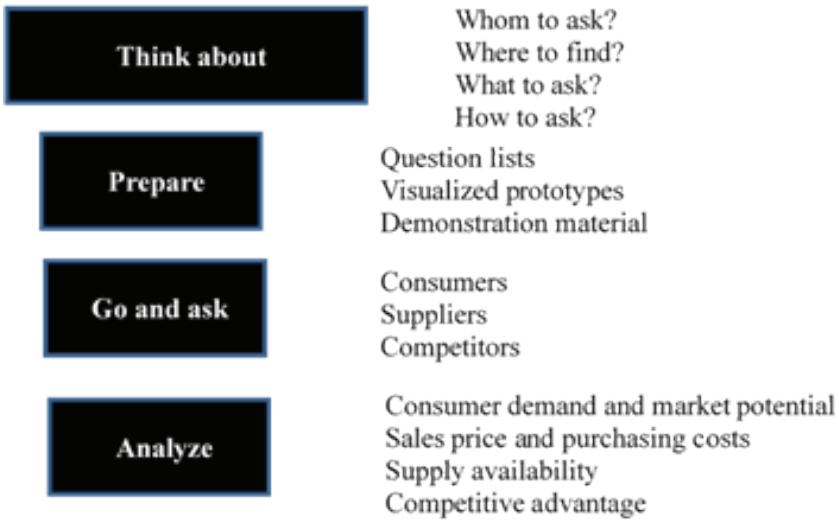
S.N	Financials	Assumption 1	Assumption 2	Assumption 3
1.	N umber of p roducts p urchased (input)(A)	10 units 2	0 units	30 units
2.	P urchase price (ETB) (B) 9	,000 9	,000	9,000
3.	P roducts sold (output)(C)	10 units	20 units	30 units
4.	S elling price (ETB)(D)	10,000 1	0,000	10,000
5.	T otal variable cost (ETB) (E) =A*B	90,000	180,000	270,000
6.	T otal fixed cost (ETB)(F) (lumpsum)	0	1,000	1,000
7.	T otal cost (ETB) (G) = E+F	90,000	181,000	271,000
8.	T otal revenue (ETB) (H) = C*D	100,000	200,000	300,000
9.	Profit (ETB) = H–G	10,000	19,000	29,000
10.	Trade margin (%) = (D –B)/D)*100%	10%	10%	10%

The differentiation above is important for calculating your profit because fixed costs too have to be taken into account in a different way because they are independent of sales. In this calculation, there are two supporting key numbers by looking at which you or a third party can get a better understanding of how the profitability of your enterprise is achieved. One of the two key numbers is the 'trade margin', or, in other words, "how much money do you make per item sold". In this calculation, you don't look at your fixed costs but only at your variable costs. So, with each item you buy for ETB 100 and sell for ETB 200, you make a contributing profit of ETB 100. To see if it seems realistic to a third party, you usually divide it by your sale price. Thus you have a trade margin of 50%. It means that 50% of the money you get from your sales goes to your pocket. Thus, others can easily judge if 50% is realistic and high enough for this kind of business. They thus better understand your profit calculation by looking at only one number.

You can then calculate your 'break-even point', which is the point at which your enterprise begins making money. With your profit contribution, you have to cover your fixed costs also before you make a profit; the break-even point tells you how many goods you have to sell to cover these costs. Every sale above this point will generate a profit in the same value as your profit contribution.

To be able to look at return on investment, you have to consider a third category of costs, investment costs, as well. These costs don't get directly included in your profit calculation. They are long-term or unique costs that don't appear often—or may appear only once—and so have to be treated differently. Furthermore, you also need to calculate your 'working capital'. After paying for all the machinery and equipment you need for your business, you still have to pay for rent, the goods you want to sell, etc. Thus, you need capital to work with, or what is called 'working capital'. Thus, a business model involves assessing whether your business makes sense from a profit and return point of view. But the numbers figuring in your business scenario should be based on data you have collected from the field, be it data relating to your defined customer, defined market size or your potential purchase and sales price.

Step 2: Final Preparation and Check. So now that you know what to check, you should summarize everything as in the scheme presented below before you start the assessment.



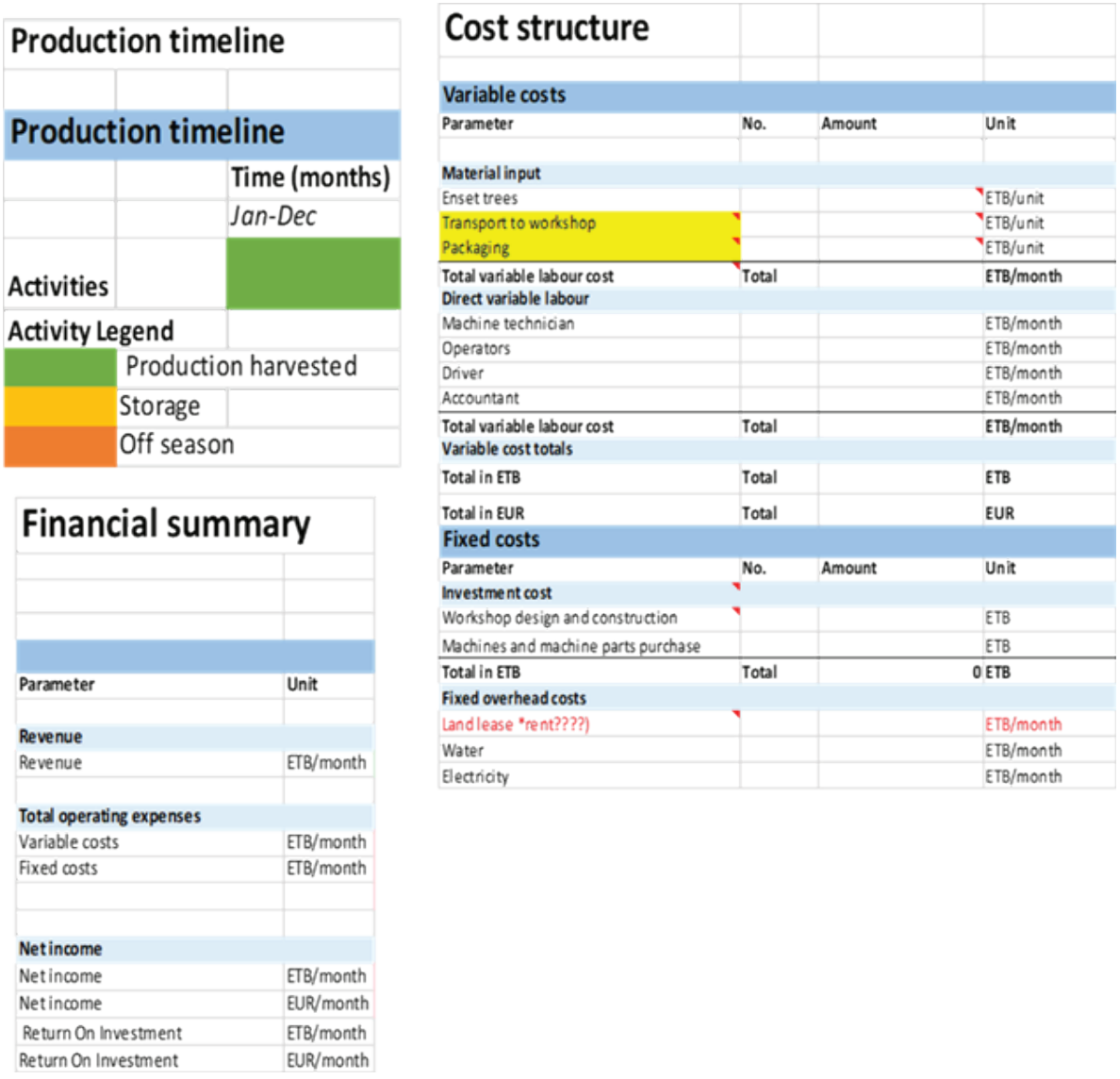
Step 3: Analyze Your Findings.On the basis of information you collect in Step 2, financial analysis will try to seek to project revenue and expenses, (forecasts come later in the full business plan), project a financial narrative; and estimate project costs, valuations and cash flow projections.

The financial analysis may typically include the following items:

- 12-month profit and loss projection
- Three- or four-year profit and loss projection
- Cash-flow projection
- Projected balance sheet
- Break-even calculation

Financial analysis of a business plan should estimate the sales or revenue that are expected to be generated. There are a number of different formulae and methods available for such estimates (Figure 16); you can use reliable hypothetically estimated data for estimate of sales. The following questions should be answered while the analysis is ongoing:

What did you find out? Are the materials you need available? How much do they cost? Where do you get them? Are there people who can perform some production steps or offer you working space where you can build your prototype? How much do they charge for that? What do your customers say? Do they like it? Do they have suggestions for improvement or inspiring thoughts? How did they react to your "quick and dirty" prototype? Did they tell you about similar offers? Did they tell you what they prefer about your solution compared to competitors' offering? Did they tell you how much they are willing to pay for your solution? Actually, who is your customer? Who is willing to buy your solution? How would you describe the customer? How many of them are there? If you know the rough number of customers in the area you can serve and at a price they are willing to pay, you can calculate your market potential (number*price). Have you found competitors who offer solutions similar to yours? What do they do differently (better or worse) and how much do they charge for it? So what do you expect as profit and how much investment do you need for it? What will be the return on that investment and your other key numbers?



Production timeline

Production timeline		
		Time (months)
		Jan-Dec
Activities		

Activity Legend	
	Production harvested
	Storage
	Off season

Financial summary

Parameter	Unit
Revenue	
Revenue	ETB/month
Total operating expenses	
Variable costs	ETB/month
Fixed costs	ETB/month
Net income	
Net income	ETB/month
Net income	EUR/month
Return On Investment	ETB/month
Return On Investment	EUR/month

Cost structure

Variable costs

Parameter	No.	Amount	Unit
Material input			
Enset trees			ETB/unit
Transport to workshop			ETB/unit
Packaging			ETB/unit
Total variable labour cost	**Total**		**ETB/month**
Direct variable labour			
Machine technician			ETB/month
Operators			ETB/month
Driver			ETB/month
Accountant			ETB/month
Total variable labour cost	**Total**		**ETB/month**
Variable cost totals			
Total in ETB	**Total**		**ETB**
Total in EUR	**Total**		**EUR**

Fixed costs

Parameter	No.	Amount	Unit
Investment cost			
Workshop design and construction			ETB
Machines and machine parts purchase			ETB
Total in ETB	**Total**	**0**	**ETB**
Fixed overhead costs			
Land lease *rent????)			ETB/month
Water			ETB/month
Electricity			ETB/month

Figure 16. Software application for financial analysis.

Group Discussion

Try to calculate the financial cost and benefits of one of the selected business scenarios using excel spread sheet. Please refer the picture while doing so!

Module 5

Business Model Scenarios for Rural Resource Centers

Module Objective

At the end of this training, you should be able to:
- Describe the basic concepts of RRCs
- Describe the purpose of their establishment
- Identify the kinds of services delivered by these facilities
- Explain how to integrate formal and informal financial institutions with these centers
- Considerations on gender and governance issues relating to RRCs
- Conduct a financial feasibility analysis of RRCs

Rural Resource Centers (RRCs) are a new agri-based business model that addresses several interrelated challenges in the agriculture sector. The centers are mandated to provide to farmers information and resources for innovative agricultural methods and approaches in an easy-to-understand format.

In a rapidly changing world, farmers need a package of innovations and services, in addition to continuous access to knowledge and information. Having all this under one roof in a rural setting can greatly accelerate adoption of innovations. Farmer training centers have been initiated in different forms by several actors. These initiatives focus on training young individuals and preparing them for a career in agriculture.

The RRCs are training and demonstration hubs managed by public organizations, often operating outside the formal extension model. They serve as a platform for farmers to share their experiences and receive technical guidance and services tailored to their livelihood needs. The emphasis here is on access to knowledge, interactive learning and networking among farmers and between farmers and other actors. At the RRC, farmers are encouraged to learn how to do their own testing, adopt successful technologies and extend them to their fellow farmers. A typical RRC comprises of a nursery, some demonstration plots, a training hall, a small library and some office space. Accommodation, catering facilities (such as a café) and agricultural processing units may also be offered depending on available resources, opportunities and needs. The key services provided by a typical RRC are summarized in Box 6.

Box 6. Key Services Provided by RRCs

- Seeds, seedlings, and other inputs
- Training for farmers in nursery practices, tree propagation, soil fertility management, group dynamics, financial management, book-keeping, marketing, etc.
- Information on new technologies and innovations
- Links with market actors, particularly the private sector
- Access to market information and microfinance opportunities
- Forum for exchange of information among farmers, and between farmers and other stakeholders-

Group Discussion 

Think of the existing Farmer Training Centers in your locality and what should be done to improve the end result.

How are RRCs different from other extension approaches?

The growth of RRCs has been gradual, driven by the capacities and resources available to the center, but also determined by the needs of the farmer community and other stakeholders. Nevertheless, their ability to build strategic partnerships with other institutions such as government services, local councils, charity organizations, research centers, universities, non-governmental organizations (NGOs) and development programs is a key element in ensuring viability and sustainability. The creation and implementation of the RRC model can be summarized in six steps (Box 7).

Box 7. Six Steps to Create an RRC

- Conduct feasibility study: Diagnose the information and training needs of farmers in the area.
- Raise awareness among farmers and identify 'champions' for RRCs, i.e., organizations already involved in farmer training and agricultural extension activities.
- Train RRC staff on technical aspects but also on adult learning, communication and extension skills.
- Create a tree nursery and gradually develop training and demonstration facilities.
- Organize demonstrations, training, field visits, etc. for interested farmer groups; and update and refine extension knowledge to remain relevant.
- Establish links and partnerships with other institutions to increase the scope of intervention.

temporary basis. It is important to build local capacity and have a clearly defined staff development strategy for a future when external support is no longer around.

Successful RRCs are not islands. They must develop and maintain strong and diversified partnerships. Connections with research organizations, universities and NGOs for capacity development and technical guidance, and with institutions that can support them financially and politically are necessary.

As these centers rely on a physical location for their research, demonstration and training activities, they require up-front investment in land and buildings. However, it has been difficult to estimate investment costs because RRCs develop gradually, and one center is different from another. Acquiring space for an RRC may not be expensive when it comes to a rural setup but there could be problems with land tenure. Some public organizations have obtained space in their own community through Kebele administration arrangements, but it is recommended to formalize 'ownership' as soon as possible to avoid later claims on the land and/or infrastructure.

RRCs also need funds for operations, the biggest component of which are staff salaries. Therefore, managers should consider alternative approaches such as working with volunteers, temporary engagement of trainers and building the capacity of farmer-trainers to achieve a multiplier effect. RRCs focus on on-farm demonstrations and center-based training, and offer little extension whereby their agents travel to other communities to extend support to farmers. The main reason for this is that they do not have adequate means of transport. However, increasing the scope of interventions beyond the community is vital for the RRCs to remain relevant in the face of evolving needs.

The centers raise funds through a combination of (i) cash from supporting organizations (NGOs, development agencies); (ii) programs/projects, charity organizations; (iii) sale of products (seeds, seedlings, farm products); and (iv) service delivery (for-fee training programs). Supporting organizations provide the majority of start-up costs and continue to contribute to yearly operating costs, at least during the initial years. Most RRCs engage in income-generating farming activities to supplement other sources of support. They also conduct for-fee training programs for clients seeking the service. In Cameroon, these three sources of finance more or less equally contribute to RRC operations. However, when an RRC focuses more on sales, less effort goes into training and extension.

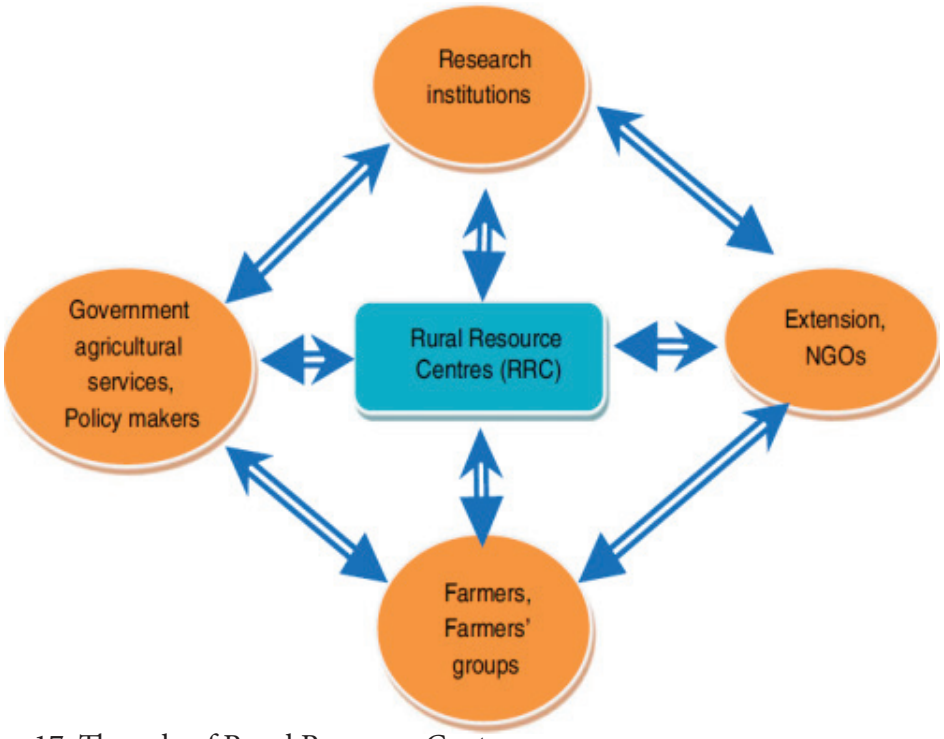


Figure 17. The role of Rural Resource Centers.

5.1. Credit and Institutional Linkages of RRCs

In promoting development that is consistent with the accepted principle of assisting self-help, self-determination and empowerment, the question of building institutional structures that can facilitate this work becomes relevant. With this in mind, an organizational framework is proposed that lays down institutional linkages between rural communities and development agents. In today's context, there is an immense role for financial institutions in rural area financing. Therefore, any strategy to bridge the rural financing gap to meet the needs of farmers requires close integration of MFIs and RRCs. The RRC thus also becomes a hub that provides all the necessary and up-to-date networking information to facilitate a good flow of information and reduce asymmetry.

5.2. Gender and Governance of RRCs

Three out of four poor people living in the developing world live in rural areas. Most of them depend, directly or indirectly, on agriculture for their livelihoods. Therefore, providing economic services such as agricultural extension is an essential tool to harness agriculture for development. At the same time, the rural poor also need a range of basic services such as drinking water, education and health services. Such services are difficult to provide in rural areas, however, because they are subject to the "triple challenge" of market, state and community failure.

It is due to market failure that the private sector does not provide such services to the rural poor to quite the extent that is desirable from society's point of view. The state is not much more effective in providing these services either. Non-governmental organizations (NGOs) and the rural communities themselves are alternative providers of these services, but often they too fall short. The reasons for these failures—by markets, states and communities—vary across the services. In the case of agricultural credit, market failures arise from the fact that the risks of crop failure affect large numbers of clients at the same time.

The rural poor suffer disproportionately from poor service provision. Where elite capture prevails, they have less access to agricultural and rural services; where the public system fails in general, they cannot easily resort to private service providers. They have to spend more of their time accessing services, which affects their productivity. Rural women, especially those from poor households, face a particularly heavy burden because the gender division of labor requires them to spend more time fetching water, getting health care for their children and reaching markets. In most of the developing world, girls have less access to education than boys. Maternal mortality is high if the specific health care needs of women are not met. Providing better services to women is therefore not only necessary to realize their rights, but also essential to promote development. As research has shown, when women have more education and better access to assets, their children are better nourished, healthier and more likely to go to school. An impressive body of evidence documents the positive relationship between gender equality, economic growth and poverty reduction (King and Mason 2001).

Providing better services to rural women is essential to using agriculture for development, as shown by the World Development Report 2008 (World Bank 2007) and the Gender in Agriculture Sourcebook (FAO, World Bank and IFAD 2008).

Ample evidence indicates, as documented in the Gender in Agriculture Sourcebook, that access to agricultural services is particularly poor for rural women. They have less access to agricultural extension and training, less access to agricultural credit, and less access to irrigation and modern inputs. They are also less likely to be organized in farmers' organizations or agricultural interest groups that make their voices heard. The result is a tremendous loss of opportunity. Achieving gender equity is not only a goal in its own right, but also essential if agriculture is to be used to spur development. Gender equity is an essential precondition to meeting SDG 1: No Poverty.

5.3 Governance and Management

RRCs are generally managed under the ownership of a grassroots organization—registered as an NGO or farmers' association—that usually also is engaged in other activities than running the center. While the overall governing structure (General Assembly, Board of Directors) often remains under the umbrella organization, day-to-day management is generally delegated to a technical director. Based on the center's needs and resources, staff may be taken on to be responsible for training, communication, production, marketing, public relations and partnerships, fundraising, etc.

To be effective, an RRC should be sensitive to the local environment in which it operates, and reflect the particular needs of the local community (Figure 16). One size does not fit all. RRCs try to achieve specialization and excellence in a few technologies or services that are highly relevant to their zone of intervention. This distinguishes them from other centers. For example, in Kenya and Cameroon, an RRC puts emphasis on soil fertility improvement and targets women farmers in particular. Another specializes in good cocoa practices and collaborates primarily with cocoa cooperatives. However, all of them also have other activities in their portfolio.

5.4 Financial Feasibility Analysis

To make an investment decision on an RRC, it is necessary to determine whether the planned investment is feasible. And the feasibility must be considered with respect to several different aspects. Carrying out a feasibility analysis is one of the most critical steps in the decision-making process.

Feasibility analysis is an effective analytical tool that can be used to evaluate investments from various perspectives, e.g., technical, social, legal, financial, market and organizational. Financial feasibility is often a predominant factor in feasibility analysis, as most investments are not realized if they do not generate profit for the project owners.

The precision and reliability of financial feasibility analysis depends on the accuracy of information used in the analysis. The appropriate level of detail has to be decided with respect to what stage the investment is in. In early stages the level of uncertainty is often high, but as the investment opportunity evolves, information becomes more detailed and reliable. As

uncertainty can adversely affect the results of the analysis, the level of detail has to be taken into account when basing decisions on the results.

To assess the financial feasibility of investments, it is important to choose the relevant criteria. Financial feasibility calculations need to be done with care, and the complexity of the calculations depends on the number of different aspects that need to be considered. The assumptions used in the calculations can, and often will, change as the project progresses and then the analysis needs to be updated.

Using mathematical models for the calculations makes it easier and less time-consuming to update the analysis. It also makes it easier to conduct sensitivity analyses on key parameters, which would allow investors to envision different scenarios and possibly mitigate the risk associated with these parameters.

Therefore, a financial feasibility study:

- Gives focus to the project and outlines alternatives;
- Narrows business alternatives;
- Identifies new opportunities through the investigative process;
- Identifies reasons not to proceed with the project;
- Enhances the probability of success by addressing and mitigating factors early on that could affect the project;
- Provides quality information for decision-making;
- Provides documentation that the business venture was thoroughly investigated;
- Helps in securing funding from lending institutions and other monetary sources; and
- Helps to attract equity investment.

The following should be considered before a financial feasibility analysis is conducted:
- The nature and scope of the issue being analyzed.
- Variables, relationships and trends likely to be beneficial to the analysis.

- Use "approximate" estimate of results to determine critical data and steps.
- Precision is necessary for the analysis.
- Reliability and uncertainty of available data.
- Format of input data (cash flow or accounting).
- Limitations of the tools applied, and how these will affect the results; and
- Importance of qualitative judgments in the context of the issue, and how they rank in significance.

When conducting financial feasibility analysis:

- Estimate the total capital requirement—seed capital, capital for facilities and equipment, working capital, start-up capital, contingency capital, etc.
- Estimate equity and credit needs—identify equity sources and capital availability, identify credit sources, assess expected financing requirements and establish debt-to-equity levels.
- Budget expected costs and returns of various alternatives—estimate expected cost and revenue, profit margin and expected net profit, sales needed to break even, returns at various production, price and sales levels, assess the reliability of the assumptions underlying the financial analysis, create a benchmark against industry averages and/or competitors, identify limitations or constraints of the analysis, construct expected financial statements, etc.

To evaluate the financial feasibility of an investment project, relevant measurements or criteria need to be specified. There are five basic types of evaluation methods:

a. Net present value methods
b. Rate of return methods
c. Ratio methods
d. Payback methods
e. Accounting methods

As seen above, financial feasibility can be measured based on accounting profits (from financial statements) or the projected cash flows of the project. Financial statements are records of actual financial activities of a business and are therefore not available for prospective projects; but projections of statements can be used to gain a better understanding of a project's finances. The cash flows of the project can also be projected and used to analyze the performance of a prospective project. The cash flow method is preferred over the accounting profits method as the former method considers the time value of money while accounting profits does not. Also, cash flows are always calculated in the same way, but accounting profits can be calculated in several different ways, e.g., using different depreciation methods or inventory listings, which give different profit results. Hence, the cash flow method is considered more appropriate for evaluating the financial feasibility of investment projects.

There are several different cash flow-based methods that can be used to measure the financial feasibility of an investment project, such as the net present value (NPV), internal rate of return (IRR), annual equivalent worth (AE) and benefit/cost ratio (B/C). These measures will be studied further below, as well as the modified internal rate of return (MIRR), which is a relatively new and infrequently used criterion. Investors use these quantitative measures to help them decide whether to undertake an investment or not, based on their return requirements.

The payback period is another method that is sometimes used in financial feasibility analysis. It determines when a project will break even, i.e. how long it takes for revenues to pay back investment outlays. However, the method does not measure profitability, as it only measures the time it takes to recover the initial investment outlay but not the profit that is made after paying back the initial investment. The method ignores all revenues and costs after the payback period and does not therefore allow for the possible advantages of a project with a longer economic life. Also, the method does not recognize the time value of money, though that can be remedied by using the discounted payback method.

We can choose any of the methods by considering the time value of money for checking the financial feasibility of a Rural Resource Center. For the sake of clarity let us discuss a few of the methods in this module.

Net Present Value (NPV). This is the difference between the present value of all cash inflows and cash outflows associated with an investment project. The NPV establishes whether the investment project is an acceptable investment given the return the investor requires from the investment.

In order to calculate the NPV, the interest rate used for discounting the cash flows needs to be determined. The interest rate is often referred to as the Minimum Attractive Rate of Return (MARR) and it represents the rate at which the investor can alternatively invest his money, i.e. the return of the most preferable alternative investment.

$$\sum_{N=0}^{N} \frac{A_N}{(1+i)^N}$$

$$NPV(i) = \frac{A_o}{(1+i)^0} + \frac{A_1}{(1+i)^1} + \cdots \ldots \cdot \frac{A_N}{(1+i)^N}$$

Where
AN = Net cash flow at the end of period N;
i = MARR;
N = Service life of the project.

If NPV(i) is positive for a single project, the project should be accepted since a positive NPV means that the project has greater equivalent value of inflows than outflows and therefore makes a profit.
The decision rule for NPV is:
If NPV >0, accept the investment;
If NPV = 0, remain indifferent to the investment;
If NPV <0, reject the investment.

Benefit-Cost Ratio. The benefit-cost method is often used for public projects. The method compares project benefits to the cost of the project. For the project to be viable, the benefits have to be greater than the cost. By definition, project benefits are the favorable consequences to the public, and project cost is the monetary disbursement required of the government. The feasibility of a public project can be expressed by comparing the benefits (B) of the project to the cost (C) of the project by taking the ratio B/C, i.e. the benefit-cost ratio.

The ratio is calculated as: $\frac{B}{C} = \frac{\sum_{n=0}^{N} b_n(1+i)^{-1}}{\sum_{n=0}^{N} C_n(1+i)^{-1}}$

bn = Benefits at the end of period n
cn = Expense at the end of period n
i = Interest rate
N = Project life
For the project to be accepted, the B/C ratio has to be greater than 1. The benefit-cost ratio yields the same investment decision as the NPV criterion.

Group Discussion 

1. Estimate the establishment cost and running cost of an RRC.
2. Identify the possible revenue streams of an RRC.
3. Calculate the estimated financial benefit of an RRC.
4. Calculate NPV/BC of establishing and running an RRC.

Conclusion

In this training manual we discussed the importance of developing business models to sustain landscape management interventions, taking exclosures and solar pump-based irrigation as case studies. The manual presented different topics relating to the development of business models through Rural Resource Centers, such as suitability mapping, identification of governance and gender issues, as well as analyzing related policies, strategies and programs and investigating the alignment of businesses with government policies and programs. Also, it presented tools for financial feasibility analysis and the key issues to consider when conducting feasibility analyses of revenue streams. This training material was prepared based on the assumption that sustainable business models offer solutions that can support landscape restoration by designing a market-oriented business model that provides win-win solutions for multiple stakeholders with positive environmental as well as socioeconomic outcomes.

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