Theme 11: Planning, starting of a dairy farm

GUIDELINES FOR PLANNING TO START A NEW DAIRY FARM OR EXPAND (Level 3)

Topic	Training & information Content
11.1	Guideline for planning to set-up or expand a new dairy farm

1. You will learn about (learning objectives):

- ❑ The first steps to take before starting a dairy farm.
- ❑ The importance of planning before starting a dairy farm.
- ❑ The steps required before expanding a dairy farm.

2. Background

- Planning is bringing future ideas into the present so that you can influence and easily change it now.

- Dairy farming has continued to attract a lot of interest among investors and new dairy farms are started and/or the existing ones are being expanded every day.

- The interest has been fueled mostly by increased demand or milk by milk processors but also by television, vernacular radio programs, peers, and articles in new papers.

- Most farmers may already be keeping some livestock but want to divert into professional dairy farming. Some farmers may want to invest in professionalizing their dairy farms because they are able to make investments through other sources of income.

3. Introduction

- Establishing or expanding a dairy farm is a very significant financial and time consuming commitment that requires detailed planning.

- Prior to undertaking such a project you should be very clear on the goals you want to achieve with the farm and the reasons why you are undertaking the project.

- Due to the large capital required it is essential that very detailed plans are developed, analyzed and stress tested.

4. Guideline for planning to start new dairy farm

- Here is important information to consider before starting a new farm ;
  1. Farm Mapping;
     i. Location of the farm,
     ii. land size and condition (e.g. land ownership),
     iii. Climatic conditions,
     iv. Soil type and soil analysis,
     v. Power to operate the farm (electricity),
     vi. Water source, quantity, and quality available,
     vii. Service providers (distance and service fees),
  2. Business plan.
  3. Implementation steps.

5. Mapping

- Where the farm is located is important because of several reasons that may affect a dairy farm. These are;
  i. Climate conditions of the farm,
  ii. Soil type will affect fodder production and construction of structures,
  iii. The topography, drainage and farm terrain (waterlogged areas and areas not suitable for crop farming),
  iv. Distance to milk market and processors,
  v. The infrastructure, security, tradition, and cultural aspects of the region.

5.1 Location; market distance

- Before starting a farm, one should research the price of the milk in the market, distance to the market, and means of transportation.

- The distance from the farm to the market may affect the quality of milk (spoilage and contamination) and transportation costs.

- If the distance is long, the cost of transportation increases and milk needs to be cooled before transportation.

- The farmer can invest in coolers that chill and therefore, the milk is stored longer on the farm.

- The delivery of milk can be reduced from twice daily delivery to transporting milk from between 24 to 96 hours after the first batch milk was put into the cooling tank.

5.2 Size of the farm

- Farm size, the land available for farming activities is important to know for several reasons;
    - First land needs to be set aside for the farm house and other dairy structures needed for the intended dairy farm type. (for example, zero grazing system, extensive or semi-extensive grazing).
    - The amount of land available for fodder production and pastures.
    - The water infrastructure.
    - The power infrastructure.

5.2.1 Size of the farm Cont'd...

- Farm size, the land available for farming activities is important to know for several reasons;

  - The number of cows to keep in the acres available,
  - In case of expansion, how much land to lease or buy to manage the increase of the dairy herd.
  - The level of mechanization that may be required to efficiently manage all farming activities.

5.2.2 Land ownership

- Land ownership is important for the farmer to be sure that the farm belongs to him/her before making major investments.

- A title deed or any agreement document that is certified by government authorities needs to be confirmed so that the farmer is secure and can start farming with peace of mind.

5.3 Climatic condition

- Rainfall; The amount of rainfall will help the farmer estimate the production of forage over a year. If the amount of rain is low then the farmer may consider investing in an irrigation system.

- Wind; The direction and speed of the wind will influence how and where the cow barns will be constructed. The strong wind will be hazardous to a farm, it may cause a distraction to buildings and the wind draft will affect the cows' performance.

5.3.1 Climatic condition Cont'd…

- Temperature; Extreme temperature (very high and low) affects both performances of the animals and forage crops. Selection of the right breed of animal and forage crop varieties that can survive in the selected region.

- Humidity; when humidity is too high or too low it affected forage crop production negatively. For example, humid air directly contributes to problems such as slow drying, slow growth and generally affects the performance of forage crops.

5.3.2 Temperature-Humidity Index(THI); Heat stress

- Heat stress is influenced by air temperature, humidity, air movement, solar radiation, and precipitation.

- However, THI is a single value showing the integrated effects of air temperature and humidity associated with the level of heat stress.

- The THI incorporates the effects of both temperature and relative humidity and is commonly used to quantify the degree of heat stress on dairy cattle.

- This index has been developed (image on the right) as a weather safety index to control and decrease heat stress-related losses.

- Learn more in module, **3.18. Heat stress in dairy cattle nutrition.**

THI	
Light	(68-71)
Moderate	(72-79
Severe	(80-89)
Very severe	(>90)
Deadly	(>100)

Humidity (%)

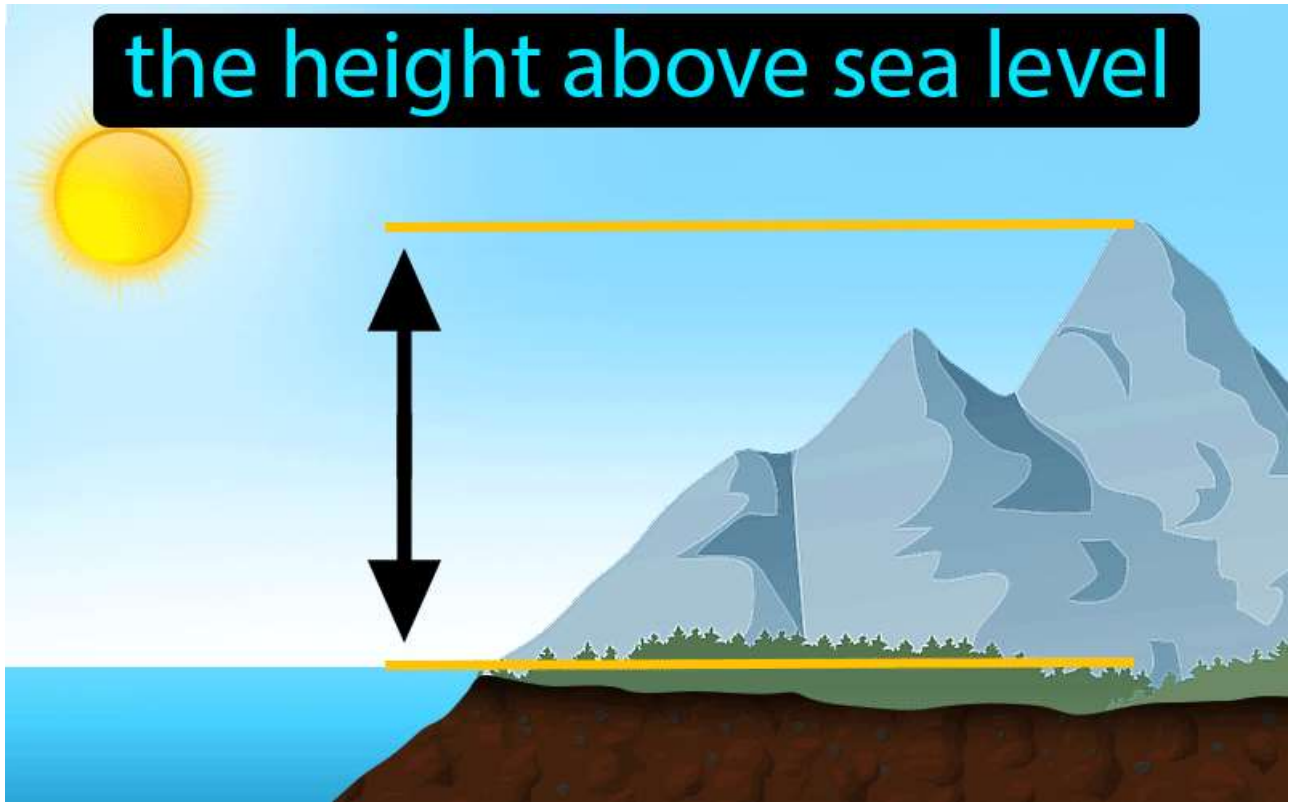
Temperature (°C)

	20	30	40	50	60	70	80	90	100
22	66	66	67	68	69	69	70	71	72
24	68	69	70	70	71	72	73	74	75
26	70	71	72	73	74	75	77	78	79
28	72	73	74	76	77	78	80	81	82
30	74	75	77	78	80	81	83	84	86
32	76	77	79	81	83	84	86	88	90
34	78	80	82	84	85	87	89	91	93
36	80	82	84	86	88	90	93	95	97
38	82	84	86	89	91	93	96	98	100
40	84	86	89	91	94	96	99	101	104

5.3.3 Altitude

- Altitude is the height above sea level. Different verities of forage can thrive better on different altitudes.

- The establishment of forage crops will greatly be influenced by altitude. Altitude can also influence biomass production of forages.



5.4 Soil type

- Soil is a natural resource that can be categorized into different soil types, each with distinct characteristics that provide growing benefits and limitations.

- Soil can be categorized into sand, clay, silt, peat, chalk, and loam types of soil based on the dominating size of the particles within a soil.

- Identifying the type of soil you require for a project is paramount to supporting the healthy growth of plant life.

- The type of soil will also affect construction, this will determine how much work will be done for the foundation of different farm structures.

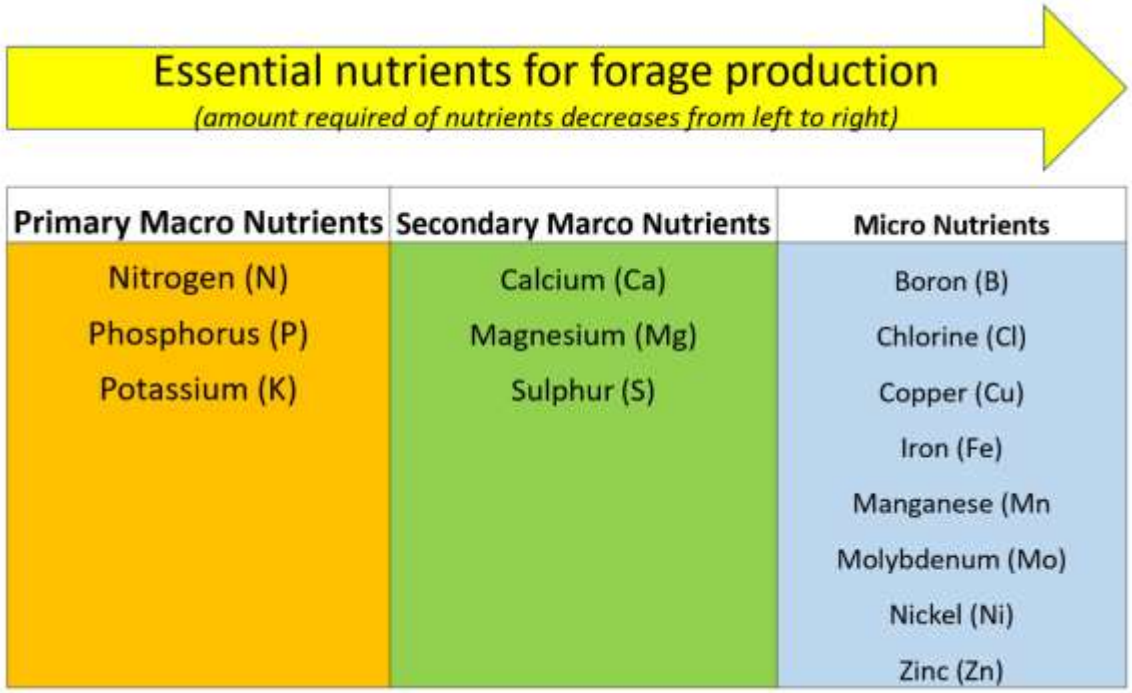
- Learn more on soil in modules ***1.2.1 and 1.2.2 integrated soil fertility management.***

5.4.1 Soil analysis

- The soil experts can provide the technical information needed for fodder producers to understand the condition and properties of their soils and develop management strategies to increase productivity and profitability and improve soil conditions.

- There are several soil constraints that affect forage production, that is including;

    - Soil PH; acidity and alkalinity
    - Water repellence and waterlogging,
    - Subsoil compaction,
    - Erosion,
    - Soil nutrient management.

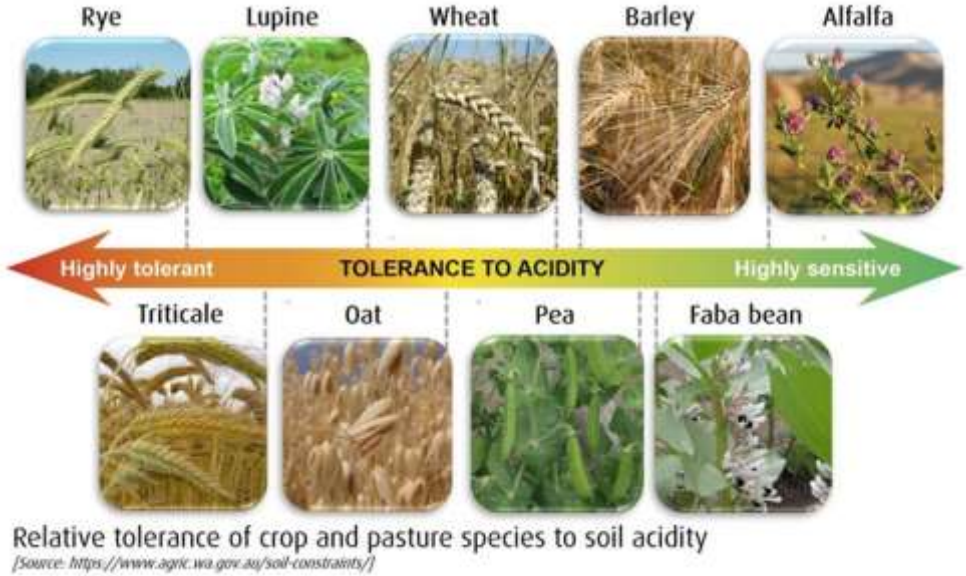


5.4.2 Soil analysis Cont'd...

- In the selected land for fodder production soil samples should be taken for soil analysis.

- The first diagram shows examples of forage that thrive in the condition of high and low acidic conditions. After soil analysis, the farmer can understand and identify which forage can thrive well under the type of soil and produce high yields or which other actions can be made if the soil is not favorable for farming.

- The soil indicators such as erosion and profile affect the building of farm structures and fodder production. A lab will need to analyze the soil and the architect will advise on the type of foundation and location to place the farm structures.



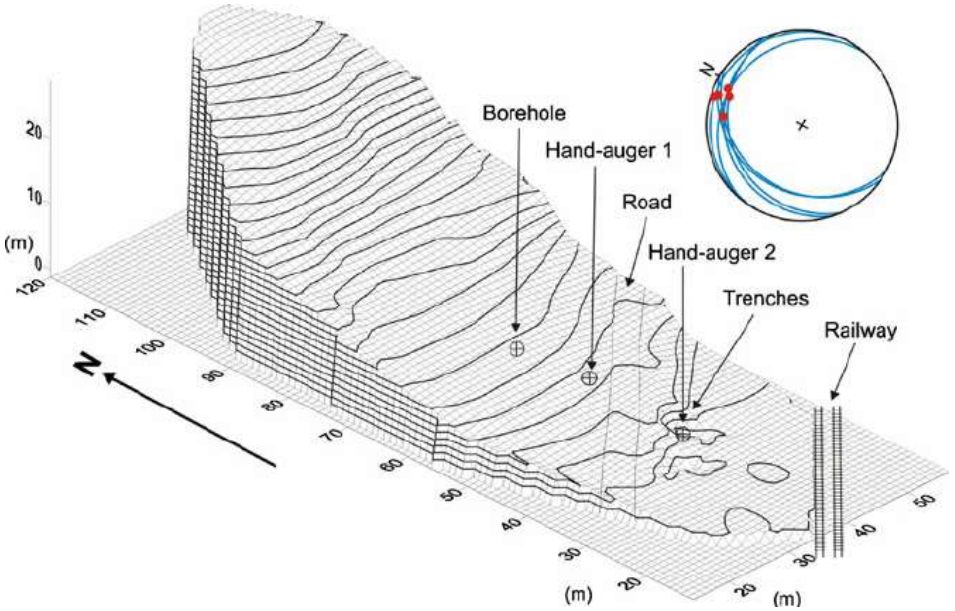
Relative tolerance of crop and pasture species to soil acidity
[Source: https://www.agric.wa.gov.au/soil-constraints/]

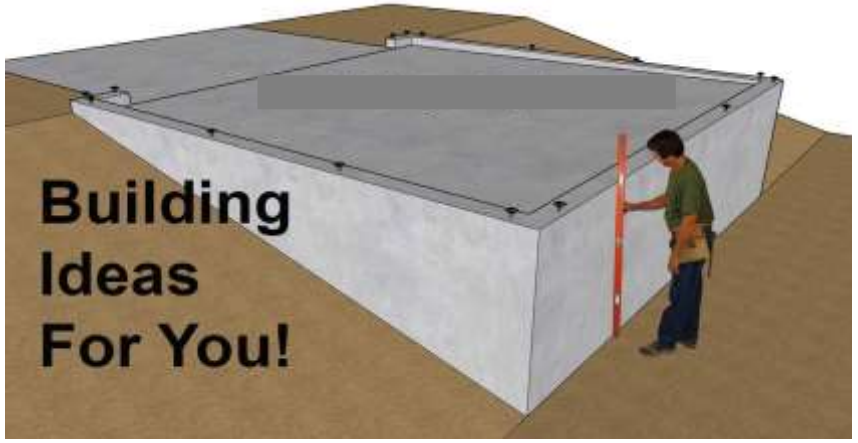
5.4.3 Topography, drainage and terrain

- A dairy building should be at a higher elevation than the surrounding ground to offer a good slope for rainfall and drainage for the wastes of the dairy to avoid stagnation within.

- However, a leveled area requires less site preparation and thus a lesser cost of building.

- Low lands and depressions and proximity to places of bad odor and should be avoided.





5.4.4 The infrastructure, security, tradition, and cultural aspects of the region

- The farm may be located in regions where keeping cows is not acceptable, for example, in estates or densely populated urban areas with intense human traffic and other controlled economic activities.

- A clear background check in the surroundings of the farm location, tradition, and culture should be researched before investing in the farm land. Failing to do so may result in the farms closer in the future.

- Starting a farm in an insecure area, high theft, cattle raiding, or attacks will discourage investors.

5.5 Power availability

- Power in a dairy farm can be used to operate the farm machinery, tool, and equipment.

- Small holder farms may not require a source of power to keep the small numbers of animals, but as the farm grows the farmer should invest in a power source.

- There are several sources of power and a farmer can select the reliable and cheapest. For example, a farmer can choose between electricity, a solar source of power or any other available.

- However, if the farm will have, some kinds of machinery or equipment that need high voltage power, then they need to get advice from electricians for the best option.

5.6 Water supply

- Abundant supply of fresh, clean, and soft water should be available at a cheap rate.

- The water sources could be a river, dam, well, borehole, or piped water from other sources.

- Running a dairy farm of any size there should be a calculation of the quantity of water required per day (for example farm activities that require water are, number of animals, irrigation, number of people, evaporation, cleaning and other activities) to maintain the dairy farm.

- The supply of water should be of good quality and quantity to manage cows and produce fodder where need be.


Bore hole water


Tap water


River water

5.6.1 Water supply and quality

- If the water quality is not according to the standard (Uganda Bureau of standard, world health organization [WHO]) then the farmer needs to consider the treatment of the water before the water is used.

- Different farm activities (drinking water, irrigation water, cleaning water, etc.) require different water quality standards.

5.7 Service provider

- Availability of suppliers nearer to the farm location is important. The service providers should be easily accessible to offer their support, services and products.
- The most essential service providers are;
    - The veterinary and artificial insemination personnel,
    - Feeds and mineral suppliers,
    - Farm tool and equipment suppliers, repair, and accessibility,
- For instance if the veterinary and artificial insemination service providers are scarce or far away, a farm may need to employ their own personnel for treatment or inseminations.
- For smallholder farms this may be too expensive and an investor will need to rely on external expertise and do it yourself after training.

6. Business plan

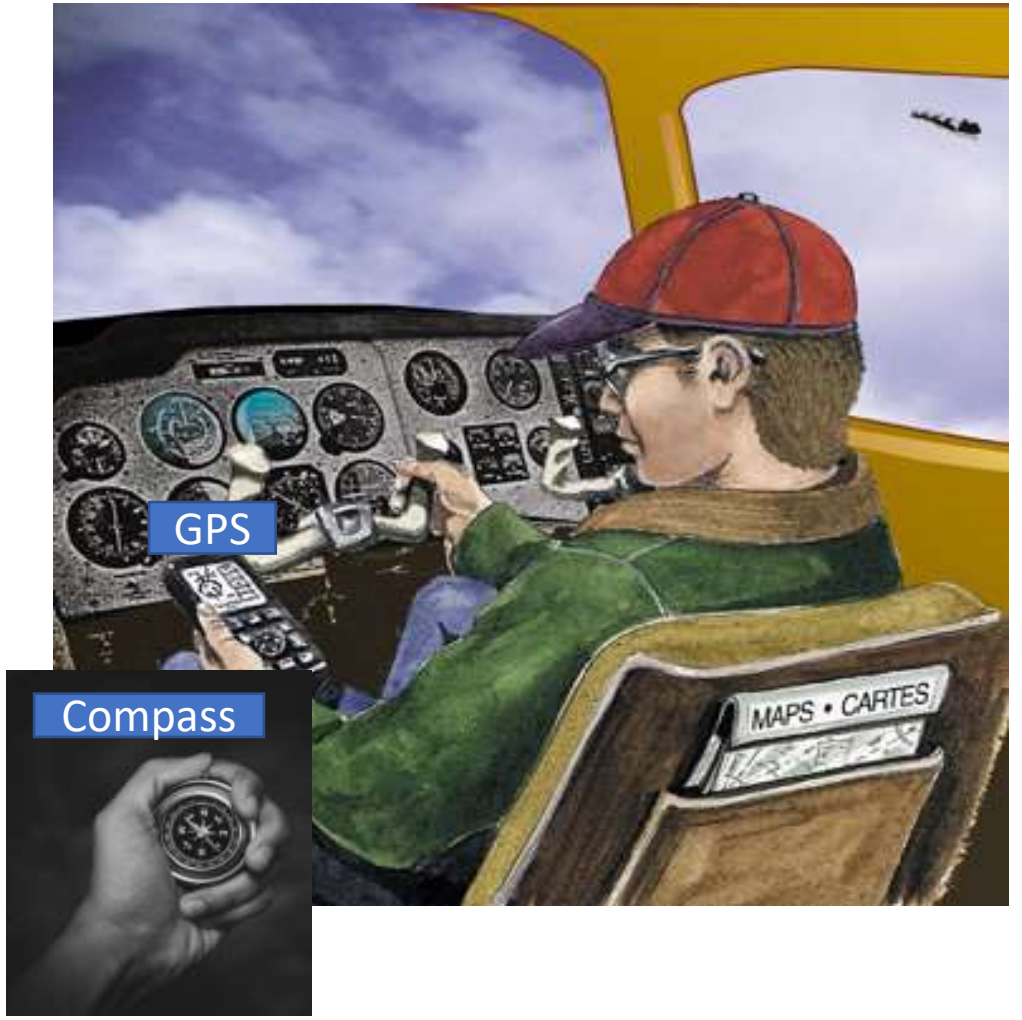
Do I need a business plan as a future dairy investor/farmer?

- Yes, and importantly so. The business plan will capture your ideas on paper and force you to answer critical questions you may otherwise overlook.

- Farmers should prepare before starting a farm because by failing to prepare, you are preparing to fail.

- The plan will help you clarify your vision and mission and guide you on the necessary actions needed to actualize it with a cost attached to each action.

- To an investor, the business plan is like a compass to a sailor or a GPS to a pilot. It is the equivalent of a flight plan for a pilot. Before starting a dairy farm, investors need to write down a list of pre-requisites.



6.1 Features of a good business plan

- Will help an investor to have a all-inclusive view of the business considering all aspects necessary for success.

- The plan contains interrelated sub-plans or components that will guide an investor/farm owner while making decisions capturing all aspects from investments, production, financial management, farm staffing, operations in addition to risk management plans and marketing in case you are doing your own value addition, for example, making yogurt.

- As a document, it will equip you with facts to help you as the investor with clarity on the business case for your dairy investment. A business plan should contain;
    1. SWOT analysis.
    2. Investment plan (financial planning),
    3. Cash flow plan (financial planning),
    4. Budget plan (Operations)

6.2 SWOT analysis

- SWOT analysis, indicate if the strengths and opportunities are understood the weaknesses and threats can be managed to make the dairy farm sector into a profit oriented business. Examples of SWOT could be;

    - Strength → Regular income to the farmer.

    - Weaknesses → Feed availability to cattle throughout the year is not adequate.

    - Opportunities → Better returns because of increased awareness in consumers about quality.

    - Threats →Natural calamities like floods, drought, and diseases that can affect feed production.

6.3 Investment plan

- Investment planning is the process of identifying financial goals and converting them through building a plan. Investment planning is the main component of financial planning. The main investments in dairy farming include;
- **Land;** for cases of expanding a dairy farm, a farmer could be required to buy more land or lease if it will be economical for the production of forage.
- **Farm structures**; The cow barn, workers quarters, farmhouse, stores, fences and security structures, etc.
- **Stocking of cows**; number and the breed of cows to stock. This decision will be influenced by available land size enough for forage growth potential on the farm and capital.
- **Farm level of mechanization**; influenced the size of a dairy farm and capital available to invest. Farm machinery such as tractors in case the farmer had large land for forage production.

6.4 Level of mechanization

- Selecting the right machinery and equipment for your dairy farm is important to ensure the reduction of unnecessary running costs.

- The tools and equipment required depend on the level of mechanization desired and the scale of operation.

- Size of the land, the number of cows, and the funds available will influence the type of mechanization that you will select to start your dairy enterprise with. For example, on farms keeping more than 20 dairy cows, machine milking may be economical and more convenient as compared to hand milking provided a good service provider is in the vicinity.

6.5. Cash flow Plan

- Cash flow is the money that’s flowing in and out of your business, hence the name.

- Having a positive cash flow means that more money is coming into the business than going out. It’s just as important as profit when it comes to determining your business’ performance.

- Keep in mind, that you might have a high overall profit but if cash flow is low, then you may still face problems like overspending or ordering in time to maintain stocks.

- In brief the importance of a cash flow plan is;
  - Make better plans and decisions,
  - Understand where you’re spending money,
  - Protect business relationships,
  - Expand at the right time.

6.6 Budget plan

- Estimate the cost of each item in the development plan, speak to other farmers who have undertaken similar scale conversions, and get quotations from dairy experts, suppliers, and contractors.

- A budget plan for a new farm must include the following to be budgeted for;

  - **Feed production budget**; Cost of producing or buying feeds for the number of cows estimated to be kept and reared. A farmer may need an expert to help with ration calculation to feed the cows for a year. See module, ***3.10. Use of Rumen8 software for ration calculation.***

  - **Labour budget plan**; estimate the number of workers needed and their allowances, covers, and salaries per year.

6.6.1 Budget plan Cont'd…

- **Cows management budget**; develop a stock budget based on the total number of stock including replacements to be bought, the cost of disease testing, transport, vaccinations, breeding, and any other cost associated with keeping the animals until the farm becomes operational.

- Decide how the development costs will be funded; how much equity is available from the sale of existing stock/assets; how much will have to be borrowed? Ensure there is adequate working capital available to start up the operation of the farm

6.7 Feed planning

- Feed planning is an important part of the viability of your dairy enterprise.
  - Feed planning is the forage, concentrates, supplements, and water that the cows needs.
  - Viability is looking at whether you can make a profit on your dairy farm.

i. At the beginning of starting a dairy farm a farmer should be able to identify the kind of ration the cows will eat. A ration is a mix of feed ingredients that are consumed in a day. For example, maize silage, Lucerne, Napier grass, concentrates, and supplements can all be mixed to make a ration.

ii. Based on the ration per animal category, calculate how much feed is needed per year for the whole herd and how much is required of each feed ingredient.

iii. Which forage to plant/grow, how many acres, and ration ingredients which to buy.

6.7.1 Feed planning; Planting or buying feeds

- After identifying how much land is available for forage production, based on the rations we can answer then the question, of how much feed will be consumed and therefore has to be panted/grown per year.

- It is recommended to plant all the forage on your farm and the only thing that you would need to buy are concentrates and mineral/vitamin supplements.

- Producing forage on a farm is generally cheaper and gives the farmer an opportunity to monitor the quality of the forages and or sell excess forage.

- However, if a farmer has not enough land and can not produce enough forage it is recommended to grow the bulkiest(forage grasses, forage maize/sorghum)and buy the remaining, possibly more expensive, but less bulky ration ingredients(maize bran, brewers waste, dairy meal).

6.7.2 Feed planning;

Planting or buying feeds

- Buying fodder can make your feed cost too high and this may only be feasible if milk can be sold at a higher price.

- When buying feeds, the farmer should ensure that he/she buys fodder and other ration ingredients of high quality at the cheapest price depending on seasonal variability and on-farm storage capacity.

- The farmer should also be alert and understand the growing season of forage crops in order to respond quickly when commercial fodder producers start harvesting to secure enough quality fodder.

6.7.3 Feed planning; Record keeping

- With the help of a dairy advisor a farmer calculates (Use Rumen 8) how much the cows can consume within a certain period (e.g. a year).

- Calculating the cows' feed quantities in different lactation stages, dry periods, as well as the needs of your youngstock.

- Keep records of feed supply, leftovers and wastes, and the cost of every ration ingredient. This is important for the calculation of your total feed cost and margin above feed cost.

- Ensure to train the staff on how much to feed the cows, frequency of feeding, recording of actual feed intake, and feeding hygiene.

- For further planning ensure to always keep and update records for the cost of forage, concentrated, and supplement.

6.8 Financial analysis

- The Financial analysis will enable the investor to determine whether the business is viable through analyzing the projected cash flows, projecting revenues and expenses while making assumptions based on market research and how you will manage associated risks (e.g. drought, financial model).
- This is so critical that most ideas either pass or are dropped if the financial analysis is not feasible.
- A clear understanding of the cash flow cycle at inception and its evolution by the dairy investor will minimize future operational and cash flow challenges.
- A well-structured financial plan will help the investor to avoid overcommitting and wasting money on unproductive assets.
- The investor will be able to quantify margins, his payback period, and return on investment key ratios needed to determine project feasibility.

7. Implementation stage

- After a clear understanding of the business plan. The next step is the implementation stage, which includes;

1. Forage production; Land set aside for forage production can be prepared for forage production. Ensure that you produce forage for cows to consume for 12 months before bringing the cow. Conservation and actual ration calculation based on the available forages and feed analysis are key.
2. Designing, drawing, and construction of farm structures as well as subdividing the grazing land into individual paddocks and walking lanes with watering points. See more on ***theme 8. Animal housing, and module 1.8. 1. & 1.8.2 Guidelines for tropical pasture management.***
3. Sourcing and selecting (pregnant) cows and heifers with the help of dairy experts. Ensure to source good, healthy cows for a good foundation herd.

7.1 Implementation stage Cont'd...

- To ensure you have a successful dairy farm follow the business plan and use it as a reference tool as your farm grow.
- Ensure you understand what investment should start for a new farm; for example, you should not buy cows before planting and storing forage. Construction of barns also comes before the cows.
- Record keeping on your farm is important for future intentions of expanding your farm. Keep the financial accounts records and the dairy management records to aid in the analysis of the performance of the farm.
- If a business plan is not followed, it can deliver untold sorrow. Whereas other factors contribute to the overall success of a dairy investment, experience has shown that a well-designed dairy investment plan can offer the investor the best bet to avoid pitfalls and set the farm on a strong foundation for future success.