

Special feasibility study report on snail farming in Bori, Rivers state, Nigeria

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ABSTRACT

A feasibility study report on the setting up of a 200 capacity snail farm enterprise at Koro farm garden, Gure town in Bori, Rivers State, Nigeria was conducted to determine if the business idea was feasible and to assess its impacts on the people. The business was named Evergreen Snail Products and Services Nigeria Limited (ESPS). It made available good quality and a very prolific *Achatina achatina* species of the African giant land snail that provided a substantial source of protein to complement our usual carbohydrate meals. The ESPS was run on both part and full time basis and with a startup capital of ₦250, 000. From this startup capital, a working capital of ₦240, 487.7 was used in running the business out of which a capital assets of ₦64, 000 was invested in for use in five years. The remaining ₦9512.3 were kept in bank and used in maintaining the business and for other miscellaneous expenses. The working capital and capital assets gave the initial outlay of ₦240, 487.7. The first year's estimated sales and net profit indicated a high success with ₦505, 947.7 cash inflows. The Evergreen snail business is a sole proprietorship medium scale enterprise aimed at consolidating and expanding the outdated snail farm in the state through increased provision of required products and services. Snail slurries are useful industrially for zymolyse enzyme production. Snails contain less fat and cholesterol therefore; its consumption helps in improving the circulatory system and standard of living of the people. The venture provided employment to all categories of people including retirees, house-wives, young school leavers, inventors, traders, local dwellers, applicants, and workers who need extra income to augment their merge salary. It generates foreign revenue without one running from pillar to post. The SWOT analysis showed that the opportunities of the business outweigh the challenges and was concluded that the snail farming business idea is healthy and feasible.

Key words: SWOT analysis, employment, foreign revenue, zymolyse, Bori.

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1. INTRODUCTION

It is clear generally that unemployment is unacceptably high and that it is here to stay except we do something about it. The Nigerian economy as it is presently run does not have the capacity to absorb chains of thousands of unemployed youth. In other words, the Nigerian graduates of today can no longer rely on the Nigerian labour market to provide him or her job. He has to invent an alternative source of employment which is self employment or entrepreneurship. Entrepreneurship is in accordance with the Nigeria's economic recovery programme objectives that necessitated a radical shift from total dependence on government for white collar job to self employment. An entrepreneur is a person that perceives business opportunities, takes advantage of the scarce resources, bears the non-insurable risks in his enterprise and directs the human and material resources in his business objectives.

To qualify as an entrepreneur, it is not just sufficient to be a business man just managing an enterprise. You are an originator of profitable business ideas. It is against this background that I have chosen this very attractive area of self employment called snail farming or heliciculture. It is one of the easiest and least expensive types of farming that provides employment opportunities to all categories of people and generates foreign revenue without you running from pillar to post. Snails farming business are healthy, less risky, less expensive and environmentally friendly.

1.1. BACKGROUND OF THE STUDY

In the face of serious and growing threat of graduate unemployment in Nigeria today, the need for the Nigerian graduate of today to seek avenues for self-employment and self-fulfillment now seems impelling. In the 1960's the problem of unemployment in Nigeria was basically that of primary and secondary school leavers. One popular explanation then was that these school leavers were ill-equipped and lack specific skills to offer the labour market. The explanation is now irrelevant today as even well equipped graduates in almost all disciplines now find that the Nigeria labour market no longer has enough jobs for them.

Thus rather than employees vainly searching for skill that are there, the situation has become one of the skill vainly searching for jobs that are not there and this call for entrepreneurship. "It was not as if I was particularly enamoured of the snail farming business idea but, at least, this is the only area I can say I had training that I can apply with ease and there was space to practice it". The study was designed to determine the feasibility of snail farming in Bori, Rivers State, Nigeria and to assess the impacts of entrepreneurship on the people therein.

1.2. BRIEF HISTORY OF SNAIL

The African giant snail (*Achatina achatina*) has coiled shells in their adult stage. They are hermaphrodite and so, they do not require a partner to copulate. They are oviparous and can lay eggs between 10 and 30 days after mating. Eggs laying takes place during the rainy season or when provided with the required food, which are mostly juicy vegetables, constant water, a favourable weather condition of an average of 25°C to 30°C and humidity of

80%. The species lays about 200 to 400 eggs in one batch 2 to 3 times a year. It takes about 11 days for its egg to be hatched in the humus-rich soil. All species of snail get matured for harvesting by the 5th to 7th months and are actually ready for consumption or marketing. Snails could live as long as 7 to 10 years in their natural habitat. Snails have different names for examples the French snail (Escargot) and the American Pomode.

The Roman snail (*Helix pomatia*), the garden snail (*Helix aspersa*) and the African giant land snail (*Achatina achatina* and *Achatina fulica*). Snails produce enzymes zymolyse used industrially to lyse the cell wall of organisms, thereby breaking the genetic barrier and allowing mating and fusion of otherwise two non compatible organisms. One interesting things about snails is that they have no noise, no adour, no irritation and hardly fall sick. Snail business is therefore a GEM in the kingdom livestock and the risks of production are low

1.3. VISION AND MISSION FOR THE BUSINESS IDEA

1.3.1. Vision of the business:

1. To contribute my quota to reduce graduate unemployment in Nigeria by engaging myself in this viable venture of snail farming.
2. To expose the idea of snail farming in Nigeria as great income opportunities and to show people on how to prosper through it despite the economy.
3. To direct employees on how to augment their income without affecting their present job.
4. To practice the adage that says “the more we are in the league of millionaire the merrier it becomes and the better for the peace and prosperity of our Nation”.
5. To let people know that Nigeria is greatly blessed with resources yet unexplored and to reveal the economic importance, nutritional composition and medicinal values of snails.
6. To promote and encourage bilateral relation between Nigeria and other countries by way of trade.
7. To reduce financial crises in our society and encourage sole trader business through example and practice.
8. To improve the standard of living of people through the provision of highly prolific *Achatina achatina* snail that does not contain fat and cholesterol.
9. To transfer the technology to retirees, house-wives, young school leavers, inventors, traders, local dwellers, applicants, Family Economic Advancement Programme (FEAP) / NGOs and workers who need extra income to augment their merge salary.

1.3.2. Mission of the business:

1. A strong desire for self-employment
2. A desire for responsibility and independence (i.e.; financial independence).
3. A desire for the glamour attached to entrepreneurship.

4. A high need for achievement and success through personal innovation and speculation.
5. A yearning desire to fulfill the needs of others.
6. A need for self-satisfaction and fulfillment through proving to oneself that: "I have the ability to take risks, maneuvers over it and succeed".
7. A desire to contribute my quota to the stimulation of Nigeria's economic growth.
8. A desire for power that a position of business leadership will give.
9. A desire to equitably distribute the snail meat to places of needs for various purposes
10. Running a business provides endless challenge and opportunity for learning.
11. A desire to be a creator and master of my fortunes – i.e., by deciding my own work programmes, work hours, what to produce, where to produce and for whom to produce. In order word, a desire to be the sole arbiter of my fitness to establish and run a business
12. A desire to pressure and conserve the very highly prolific species of *Achatina achatina* snail for future reference, research purposes, recreational activities and medicinal uses.

1.4. OBJECTIVES OF THE BUSINESS

1. To expand and consolidate the outdated snail farm in the Bori, so as to enhance productivity, reduce unemployment, facilitate Nigeria's economic growth and reduce youth restiveness in the state.
2. To champions the production of a very highly prolific species of snail that can lay about 200 to 400 eggs in one batch 2 to 3 times a year.
3. To accumulate a lot of wealth, fame, social distinction and recognition from the use of my talents and energies in building and managing a successful snail farming enterprise of my own.
4. To acts as the technological base of the economy which reveals micro-economic facts pointing to developments that would enhance income parity, raise capacity utilization of industries, lower inflation by producing more competition.
5. To invent an alternative source of employment which is Self Employment/Entrepreneurship, thereby becoming self reliant, self-sufficient and self-dependent.
6. To improve the standards of living of the general populace through improve production of snail species that is low in fat and without cholesterol. Hence, improving the circulatory system and Health of the citizenry.

1.5. PROJECT DESCRIPTION

1.5.1. Business Idea: The business idea was the setting up of a 200 capacity snail farm business in Gure town, Bori City, Rivers State. The snail farm was located at Koro Farm Garden (KFG) in Gure Community while the business office was 34 mayor streets, Bori in Khana Local Government Area of Rivers State.

1.5.2. Conceptualizations of idea: Reasons for chosen the business:

1. It is a practicable and viable venture yet unexplored in Nigeria.
2. This technology has been approved to most lucrative farming venture presently, as it requires far less capital investment, which much profit is being generated in a considerable short period.
3. Virtually every part of snail is of vital use in food, pharmaceutical, manufacturing and fishing industries.
Snail farming has lower risk compared to other livestock farming.
4. The demand for snail is higher than its supplies as such the market potential of snail is inexhaustible, locally and internationally.
5. Snail as an export commodity, which has value next to gold on overseas countries. It is a foreign exchange income earner of our days.
6. Rivers weather is one of best in snail breeding. Snail breeding has no stress, no time consuming, no odour, no noise and no irritation.
7. If your startup capital is #100,000 for example, you can generate the sun of #1000, 000 in one year. Some people in other livestock may earn another #100,000, if they met no risk in a year.
8. One can keep his present job and do this on a part-time since it doesn't require much time.

1.6. FEASIBILITY OF THE STUDY

The SWOT analysis reveals the strengths, weaknesses, opportunities and threats of the business idea.

1.6.1. Strengths: The following constituted the strengths of the business:

1. Adequate start-up capital
2. Low risks of production
3. Availability of high quality breeds of snails
4. High demand for snails
5. Good market potential
6. Best location (area with fresh vegetation)
7. Best weather condition
8. Few competitors
9. Availability of space
10. Good communication network
11. Good road network
12. Adequate manpower (skilled and unskilled)

1.6.2. Weaknesses: The following are my weaknesses:

1. Payment of taxes (e.g., sales tax, capital gain tax)
2. Getting licenses and permits
3. Registration (e.g., with corporate affairs commission, C.A.C)
4. Insurance (Certain risks such as fire, export credit and accident will be insured)
5. Local competitors (e.g., rural dwellers)
6. Obeying employers' regulation (e.g., granting of sick leave, holidays to workers, settling of disputes).

1.6.3. Opportunities: The opportunities included:

1. Collection of snail breeds is free. Especially during rainy seasons, snails are collected from under stones, damp, leaves and cover crops.
2. Snail feeding is simple. Snails are vegetarians and as such their feeds are very local, mostly juicy vegetables which are available in the area.
3. It is easy to maintain. One only needs to change the feeds in the snail's pen once a week to prevent rotting. Their pens are simply covered with nets to them from predators.
4. As a part-time vocation, it can be successfully run alongside one's actual job or other businesses.
5. If a grower begins a snail farm with say 50 snails, it can produce averagely up to 250,000 adult snails worth over #500,000 in a year.
6. The risk of losing snails in the farm is very low compared to other livestock farming.
7. Rivers State has one of the best climates for snail rearing.
8. Lastly, snails hardly fall sick, they are hermaphrodite; you don't have to buy food, you don't spent much to create an abode for them, they reproduce rapidly and are very important foreign exchange income earner of our days.

1.6.4. Threats: The basic threats to the business are mainly unsystematic risks including the following:

1. Present of predators such as insects, birds, lizard, toad, frogs, nematodes, millipedes, ear wigs and fungi.
2. Human interferences including vibration and unnecessary noise from automobiles and industries within.
3. Harsh lighting torch, lanterns and sounds.
4. Theft.
5. Pens wetting especially during the dry season.

The other threats confronting the business are systematic and as such, the business shall be insured to overcome unstable government policies and regulations. From the SWOT analysis above, it is crystal clear that the opportunities of the business outweigh the challenges. Hence, the business idea is feasible and can be executed without you running at lost because the financial benefits levels out the challenges.

1.7. LOCATION AND WHY**1.7.1. Location:** The 200 capacity snail farm business otherwise named "Evergreen Snail Farm Nigeria Limited" was located at:

Koro Farm Garden, Gure Community, Khana Local Government Area, Bori, Rivers State. The above address represented the site of snail rearing while the address below represented the marketing office:

No 34 Mayor Street, Off Rivers State Polytechnic Road, Bori, Khana L.G.A, Rivers State.

1.7.2. Reasons for the locations: These two locations were chosen after the SWOT analysis. The former address was selected based on the following reasons:

1. Availability of space
2. Availability of water and humus-rich soil
3. Presence of juicy vegetables and aromatic plants as laurel that are used as feeds for snails
4. Calmness and secure environment
5. Access road and communication network
6. Favorable weather condition for snail breeding
7. Availability of manpower (both skilled and unskilled).

While the later location was selected based on:

1. Large market size
2. Good market potential
3. Less number of competitors
4. Presence of customers, both local and international
5. Availability of labour
6. Presence of inventors
7. Closeness to Bori international market.

1.8 MARKET ANALYSIS

1.8.1. Industrial analysis: Industrially, Bori is one of the industrialized cities in Rivers State with good market potential. The city has several markets which ranged in size from 7800x9600cm to 12800x14400cm and 42200cm x 55500cm respectively. Local dwellers, investors and traders from all over south, east and west come to these markets to buy goods and services.

1.9. MARKETING STRATEGY

The marketing strategy adopted includes the “**4 Ps**” method. The “4 Ps” are:

1. Product
2. Price
3. Place and
4. Promotion.

1.9.1. Product: The matured snail shall be sold raw and also in its processed form. The processed snails shall be properly washed using alum and salt and weighed accordingly, refrigerated and supplied to entries, food stores, and place of need.

1.9.2. Price: The price for each adult snail depends on the weight and quality. For example, matured raw snail in-shell cost ₦ 500 to ₦ 600 per one while the same size of the processed snail cost ₦ 600 to ₦ 700 per snail respectively.

1.9.3. Place: The main production shall be Koro Farm Garden, where there is no noise but adequate maintenance including security. While the marketing office shall be in an open place, 34 Mayor Street, Bori where all my customers can have easy access.

1.9.4. Promotion: Both advertising and sales promotion shall be use. The nutrition benefit of snails will be made known. Discount shall also be given with respect to quantities purchased. Some dry snails shall be made available to customers who wish to taste the product.

1.10. DEMAND AND SUPPLY

The demand for snail meat and its products are higher than the supplies as such; the market potential of snail is inexhaustible, locally and internationally. My observation shows that out of 100% snail needed in Bori market for both local and international consumers in a year, only 68% was available. There is, therefore, the need for increased production in other to meet up the 100% snail demand.

1.11 MARKET SHARE (GAP ANALYSIS)

My forecast for a period of one year shows that s total 100 units of snails was marketed in Bori market by both my competitors and me. Of these 100 units sold my business 60 units while the other competitors sold a total of 40 units all together in year ending. The Gap analysis, i.e., my market share is 70% while that of my competitors 40%. It was then concluded that my sales levels out that of my competitors and that they are seriously defeated. Hence, the business was successful. The “4 Ps” marketing strategy was used to achieve this high sale.

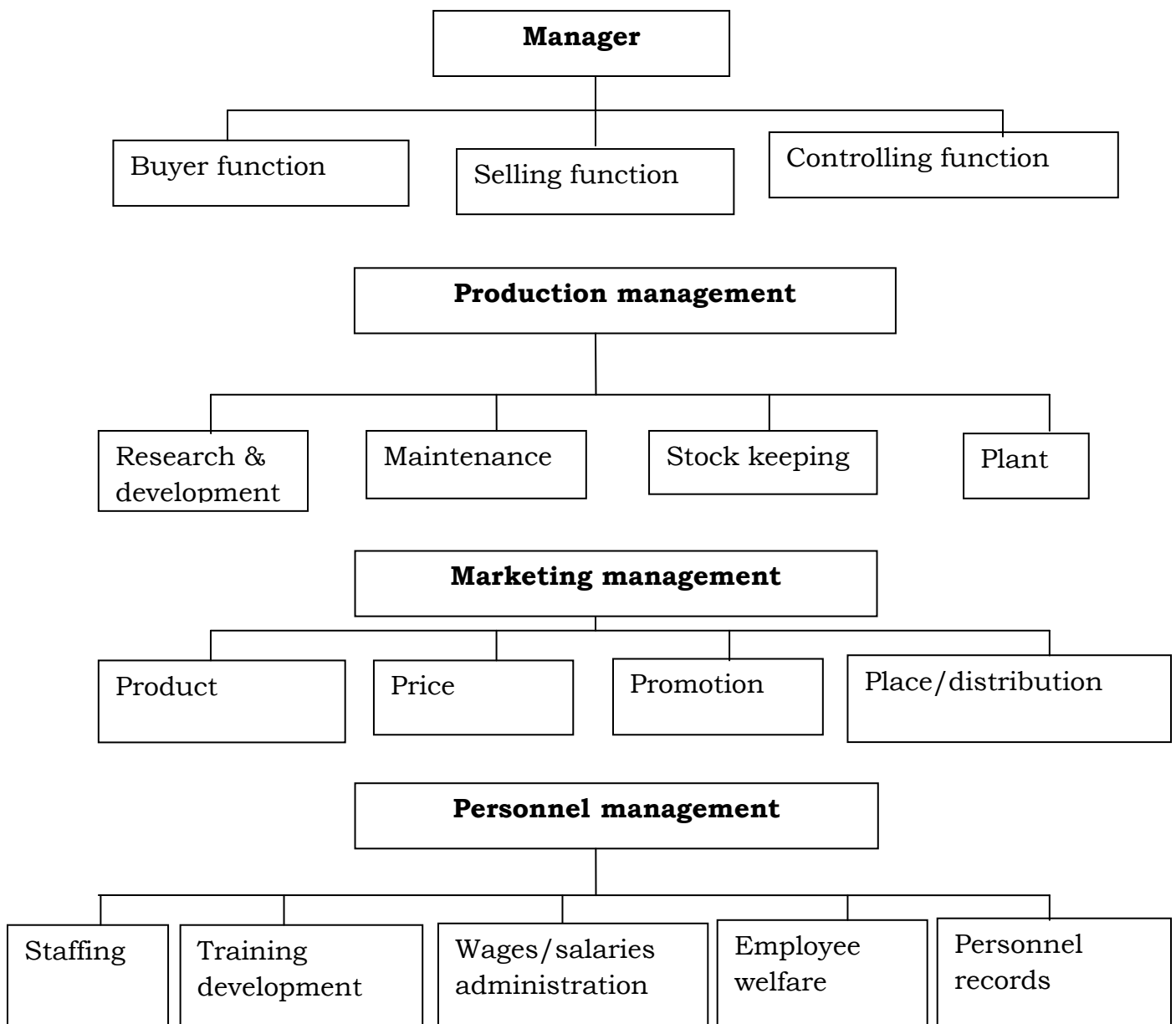
1.12. FORM OF BUSINESS AND ITS ESTABLISHMENT

The business is a sole proprietorship business. The idea was considered lucrative prior to its high income earning capacity and simplicity of operation.

1.13. LEGAL FORM OF THE BUSINESS

The legal form under which this snail farm business shall be organized is sole proprietorship. I will serve as the manager and chief executive officer (CEO) of the business coordinating the labours and day-to-day affairs. As a sole trader, I oversaw the production function, marketing function, personnel management function and other miscellaneous functions as showed in the organizational structure below:

1.14. ORGANIZATIONAL STRUCTURE OF THE BUSINESS



1.15 MANPOWER REQUIREMENT

Both skilled and unskilled staff will work in the snail farm. While some will work full time, others will work on a part-time basis. Below are the names and function of my workers in the ESPS Nigeria limited:

Name	Function	Time in production	Qualification
Names	Building	PT	SK
Sira	Buying	PT	USK
Uche	Collecting	PT	USK
Nasir	Feeding	FT	SK
Bola	Maintaining	FT	SK
Nuaka	Selling	FT	USK
Sule	Recording	FT	SK
Sole	Managing	FT	SK
Basir	Promoting	FT	SK
Ada	Distributing	FT	USK
Auwa	Processing	PT	SK
Audu	Securing	FT	SK
Bale	Sanitizing	FT	USK

Key: PT = Part Time, FT = Full Time: SK = Skilled, USK = Unskilled.

Note: Number of workers SK = 8, Number of workers USK = 5, Number of workers FT = 9, the number of worker PT = 4.

Total number of workers required = 13.

1.15.1. Manpower cost: The manpower cost of the business depends on the hours spent in production and weather skilled or unskilled labour. Calculation for the manpower cost is done in the direct labour cost form and indirect labour cost form respectively.

1.16. TECHNICAL ASPECTS

1.16.1. Plant and machinery Requirement:

A standard refrigerator is required to keep the processed raw snail frozen before distributing to the various eateries, food stores and places of needs.

1.17. RAW MATERIALS INPUTS REQUIRED FOR THE BUSINESS

The direct raw materials required for the snail farm business are stated below:

1. Plastic aquarium for transportation
2. Manual water sprinkler
3. Sponge or rag
4. Pebbles holes
5. Cactus flowerpot
6. Soil (humus, from gardener's shop)
7. Ashtray or small plastic box.

2. BUILDING PROCESS

The pen building and snail production involves four major phases:

2.1. Phase one: Clean up the terrarium with regular soap plenty of water, be thorough to get rid of the minimum debris, and dry it well. Prepare the substrate by scattering a 2-inch-high humus rich soil on the bottom of the terrarium. Fix the soil with your hands and not very hard and in a way it looks like the soil out there, not as flat as carpet.

2.2. Phase two: Make a trough with the cactus flowerpot, but since snail have no mouth to drink with, you have to help them out and especially when they are babies because that is the first or second thing they do once they are born and with a sponge or a plate to moisten them. Be careful the water does not evaporate. You place the flowerpot half buried on a corner so the land snails (*Achatina achatina* species) do not turn it over.

2.3. Phase three: Place the pebbles on the soil, living a free corner for the ashtray and the plastic box, in which you will out gravel or any rock for balance, so it does not turn over when the snails eat.

2.4. Phase four: Moisten the soil mildly with the water sprinkler every night or every two nights since snails are nocturnal or night creatures and seek for food when they feel moist around.

3. PRODUCTION PROCESS

After pen construction, snail's production involves a careful but simple procedure as showed below:

3.1. Buying/Collecting: Breeds of snails can be purchase from competent snail farmer who ensures that snails of the same sizes are sold to enhance their reproduction. Snails are also collected freely from the environment during the rainy seasons. The best location for collecting snails are cities with green vegetables, under stones, damp, in a day that is about to rain or where it has rained already, because that is the time when land snails come out. Note: make sure to buy or pick snails of about the same size, otherwise the reproduction will not be fertile enough.

3.2. Feeding: For feeding snails you have to keep in mind their 'vegetarian status', therefore you will have to feed them with juicy vegetables and fruits

which includes pawpaw, mango, cocoyam, pineapple, sweet potatoes, leaves, peels from yam; lettuce, tomatoes, beans, water leaf, citrus, carrots, cucumber, and aromatic plants as laurel. You can also give snail's old bread (in good condition) or calcium-rich foods necessary for shell formation.

3.3. Maintenance: Snail maintenance is not big deal; you have to change their food once a week to prevent rotting, and give them a mouthy-bath with lukewarm water in case they present fungi; important: Be careful with baby snails, their shell are very fragile.

4. INFRASTRUCTURE REQUIREMENTS

There is access road to the snail farm at Koro Farm Garden and the market office in Bori City. There is also presence of constant power supply and water. The availability of a standard refrigerator is also of immense help to the business.

4.1. ENVIRONMENTAL ANALYSIS

Snail farming is a GEM in the kingdom of livestock. It is environment friendly and as such; do not add any danger to the environment. Snails have no odour, no noise and no irritation as stated earlier. The presence of snails helps to reactivate the soil and makes it fertile. The feeding habits add manure to the soil and this support high yield of crops.

4.2. PROJECT TIMELINES

Specific time is set for each phase of production of one batch of mature snails. The period of 5 to 6 months has been recommended for harvesting one batch of mature land snail. At the end of the 6th months care are taken to remove the adult snails and then the baby snails continues to grow in the same pen.

4.3. LEGAL AND REGULATORY FRAMEWORK

The legal responsibilities as I undertakes the business will includes the following:

1. Paying taxes (sales tax, capital gain tax)
2. Getting licenses and permits
3. Registration with Corporate Affairs Commission, (CAC)
4. Obeying regulations regarding employees, such as working hours, holidays, occupational safety and health, sick leave, settling of disputes, injuries at the work place and minimum wages.
5. Insurance. The business shall be insured against drop in the demand of snails and snail's products. The uninsurable risks such as theft and invasion of predators into the snail's pen which can eat up a whole lot of them cannot be insured and as such, care and adequate security will be provided for it.

4.4. BUSINESS RISKS ANALYSIS

Both systematic and unsystematic risks confront the business. The systematic risk includes government policies and this is external while the unsystematic risks are internal and include the following:

1. Human interference
2. Theft
3. Harsh lighting torch
4. Unnecessary noise
5. Vibration
6. Predators: ants, lizard, ear wigs, toads, millipedes
7. Fungi
8. Wetting of snails pen, especially during the dry season.

4.5. STRATEGY TO MITIGATE THE RISKS

The litigants to the potential risks of the business include:

1. Construction of an idea snail's pen. An idea snail's pen is a rectangular-shaped enclosure made of wood, cement; 6-inch blocks and galvanized sheet steel to house the snails. The floor of the pens must be filled with humus and top covered with net to ward off birds and other predators.
2. The humus-rich soil should be scattered 3 to 5 inches deep so as to support the hatching of the eggs and prevent their direct contact with clayed soil capable of causing drying and death of snails because it is water logged
3. Snail's pen should be constructed some distance from main town to avoid vibration and unnecessary noise.
4. During the dry season, adequate water supply should be sprinkled over the pen to enhance their feeding, reproduction and keeping them alive. Failure to wet their pen makes them go on aestivation or period of dormancy.
5. Adequate security against theft. The pen ranges from the use of pots, drums and plastic enclosures to ponds. Open pond or pen for the free range system allows the snails to dwell in what is a replica of their natural habitat
6. Snail farmers must change their food regularly to prevent rotting, and give them monthly-bath lukewarm water in case they present fungi.
7. Avoid any form of human interference to the pens, including the use of harsh lighting torch at night and unnecessary vibration and noise
8. By insuring the business against unstable government policies, most important systematic risk controlling the business.

4.6. ECONOMIC AND SOCIAL JUSTIFICATION

Snail is an export commodity, which has value next to gold in overseas countries. Economically, snail is a real export market that earns foreign revenue without you running from pillar to post. If your startup capital is #100,000 you can generate the sum of one million naira in one year. Socially, snail's shells are used for recreational purposes including beautification of homes, and many other events. This also boosts the economy of a country. The shell of snail is also of industrial importance as it

is use in the manufacture of other raw material. Its enzymes are use in genetic engineering for cell wall treatment. The supposed waste aspect of snail after processing is essential in agriculture and particularly in fish farming.

4.7. EMPLOYMENT GENERATION

Snail farming business is a form of self-employment and as such, will provide work for all category of people in the society including retirees, House wives, Young School Leaves, Inventors, Traders, Local Dwellers, Applicants, Family Economic Advancement Programme (FEAP)/NGOs and Workers who need extra income to augment their Merge Salary.

4.8. PROVISION OF PRODUCTS AND SERVICES

Snails are one of the best meats in the kingdom of livestock. It has been noted that snails has the highest level of meat protein without fat and cholesterol and it is being recommended for medication. The African giant snail is always in high demand in Europe, because what they have there is the Helix species (x8 smaller than the giant snails). The land snail, Achatina achatina species can provide a substantial source of protein to complement Nigerian carbohydrate meals. Its fast rate of reproduction also makes available the high quality form of meat protein to consumers. The nutritional composition of raw snails (per 100 grams of edible portion) is shown in Appendix.

4.9. FOREIGN EXCHANGE SAVINGS

The detailed cost of the business includes the direct materials costs, direct labour costs and indirect costs, which gives the total cost of the business.

4.10. (1A). DIRECT COSTS OF THE BUSINESS

Direct material cost form per item/1batch of matured land snails

1	2	3	4
RAW MATERIAL	BUYING COSTS (₦)	QNT./ITEM	COST/ITEM (₦)
Breeds of snails	10/breed	300	3000
Plastic aquarium	450	40	18000
Manual water sprinkler	680	50	34000
Sponge or rag	150	14	2100
Pebbles holes	450	55	24750
Cactus flowerpot	700	54	37800
Humus rich soil	450/kg	85kg	38250
Ashtray or small plastic box	380	18	6840
TOTAL			164740

4.11. (1B). DIRECT LABOUR COST**Direct Labour Cost Form/ One batch of matured land snails**

			Direct labour costs		Indirect labour costs	
			#			
1	2	3 ₦	4	5 ₦	6	7 ₦
Nanu, building	160	6,000	-	6,000	-	-
Sira, buying	160	2,000	-	-	160	2,500
Uche, collecting	160	2,500	-	-	160	2,500
Nasir, feeding	160	8,500	160	8,500	-	-
Bola, maintaining	160	8,000	160	8,000	-	-
Nuaka, selling	160	2500	-	-	160	2,500
Sule, recording	160	2,000	-	-	160	2,000
Sole, managing	160	7,800	160	7,800	-	-
Basir, promoting	160	6,500	160	6500	-	-
Ada, distributing	160	2000	-	-	160	2000
Auwa, processing	160	2500	-	-	160	2500
Audu, securing	160	7500	160	7500	-	-
Bale, sanitizing	160	6000	160	6000	-	-
Total			960 hrs	503000	960 hrs	13500

Note: (1) Direct labour cost = Total pay for time in production = column 5
Total = ₦ 50300

(2) Indirect labour cost = total pay for time not in production = column 7
Total = ₦ 13500

(3) Direct labour cost per hour = total pay for time in production/total hours in production per month

$$= \frac{\text{₦ } 4350}{960 \text{ hours}} = \text{₦ } 45.3$$

4.12. (2). INDIRECT COSTS**Indirect costs form per month**

Rent	₦ 1000
Licenses and permits	₦ 1250
Electricity and water	₦ 1000
Interest on loan	₦ 50
Insurance	₦ 45.5
Stationary	₦ 35.5
Promotion	₦ 1500
Indirect labour (1)	₦ 13500
Depreciation (2)	₦ 1066.7
Miscellaneous	₦ 6000
Total	₦ 25447.7

4.13. DEPRECIATION

A refrigerator shall be purchase and use for five years in preserving the processed snail before distributing to customers. The cost price for the refrigerator is ₦ 64000.

Calculation for depreciation:

$$\begin{aligned} \text{Depreciation,} &= \frac{\text{Total cost of buying the refrigerator}}{\text{Number of years the refrigerator will be used}} \\ &= \frac{\text{₦ } 64000}{5 \text{ years}} = \text{₦ } 1280 \end{aligned}$$

Depreciation cost form

Depreciation form Refrigerator	
Bought	1 st year
Buying cost	₦ 64000
Estimated to be used	5 years
Depreciation per year	
1 st year	₦ 12800
2 nd year	₦ 12800
3 rd year	₦ 12800
4 th year	₦ 12800
5 th year	₦ 12800

$$\text{Thus, Depreciation per month} = \frac{\text{₦ } 12800}{12 \text{ months}} = \text{₦ } 1066.7$$

Detailed cost of the business = Total cost of the business.

$$\text{Thus Total cost} = \text{Direct Material Costs} + \text{Direct Labour Costs} + \text{Indirect Costs} = \text{N}164740 + \text{₦ } 50300 + \text{₦ } 25447.7$$

$$\text{Total costs} = \text{₦ } 240487.7$$

Hence ₦ 240487.7 is required to start the snail farm business. Although the sum of ₦ **250,000** was required so that the balance of ₦9512.3 will serve as back up capital in bank in case of any emergency.

4.14. PROPOSE SOURCES OF FINANCING THE BUSINESS

The 200 capacity proposed snail farm which is to be cited in Koro Farm Garden in Gure town, Bori, Rivers State is a medium scale sole proprietorship enterprise. As a sole trader and manger of the snail firm, my proposed sources of financing the business are through the NYSC/ CBN venture prize award and grants from any reputable nongovernmental

organization (NGOs), including the NDE and Government of Rivers State of Nigeria.

4.15 FINANCIAL PROJECTIONS: 3-5YEARS

The analysis of financial projection using financial indicators as NPV, IRR, PI or BCR, PB; DPB, ARR (ROI) and sensitivity analysis, cash flow plan are vividly calculated in Appendix.

4.16. LEGAL AND REGULATORY FRAMEWORK

The legal responsibilities as I undertook this business included the following:

- Payment of taxes (e.g., sales or VAT tax, capital gain tax)
- Registration of the business (with the corporate affairs commission, CAC)
- Getting licenses and permits
- Obeying regulations regarding employees (such as working hours, holidays, sick leave, occupational safety and health; and settling of disputes among employees).

•

4.17. PROJECT RISK ANALYSIS

The systematic risks such as government policies affect all business. The major risks confronting this snail farm business are unsystematic risks within the business and then include the following: Human interference, Theft, Predators: ants, lizard. Ear wigs, toad, frogs, nematodes and birds, millipedes, Fungi, Vibration, Unnecessary noise, Harsh lighting torch, wetting of snails pens especially during the season.

4.18. STRATEGY TO MITIGATE THE IDENTIFIED RISKS

The systematic risks such as irregular government policies, inflation of materials and a drop in the demand of snails and snail's products are insured against. The uninsurable risks such as theft and invasion of predator into snail pens should be prevented by adequate security and maintenance of their pens. The other suggested litigants have been stated.

4.19. ECONOMIC AND SOCIAL JUSTIFICATION

Economically, snails as great money-spinning venture, we definitely enhance the growth of our economy and bring in huge sum of money. Socially, snails are used for recreational activities and ornamentation. Snail serves as food to fish and our fish farmer have witnessed remarkable yield in fish production. Our pharmaceutical industries now have drugs that enhance the function of the circulatory system. Creams and Jewelries are made from snails and its product. It is easiest and least expensive type of farming. All you need is a little space for your snail and then gets your breeds of snail to start. Averagely a good breed of snail will lay about 400 eggs per clutch and you have as much as say 50% hatchability. It is the main export commodity of our days.

4.20. PROVISION OF PRODUCT AND SERVICES

The African giant snail, the *Achatina* species is always in high demand in Europe, because what they have there is the *Helix* species (x8 smaller than the giant snails). It has been noted that snails has the highest level of meat protein without fat and cholesterol (Appendix) and it is being recommended for medication. Snails are a delicacy in Africa cuisine, Japanese and Chinese in particular. The French delight escargot (snail) as an appetizer. Where as in Americans and Australia, where it is commonly also called abalone, it is consumed also as main meat. In Africa, such as Nigeria and South Africa, land snail called Giant African snail is also a traditional food. Snail recipes vary from cuisine to cuisine.

Studies on the nutritional value of social revealed that snail is 15% protein, 2.4% fat and about 80% water. This makes snail healthy alternative food for people with high protein low fat diet requirements. Besides, snail is high in health benefiting essential fatty acids such as linoleic acids and linolenic acids. A study on a snail species in Brazil estimated that 75% of the fat in snail is unsaturated fatty acids. That is 57% polyunsaturated fatty acids, 15.5% of monounsaturated fatty acids, and 23.25% of saturated fatty acids. The nutritional value of snail including list of nutrients and their content in raw, snail are presented in Table 1 in Appendix 1.

4.21. IMPORT SUBSTITUTION

Snail farming is a great foreign exchange savings of our days. If the startup capital is one hundred thousand naira your can generate the sum of one million naira in one year. Some people in other livestock may earn another one hundred thousand, if they met no risk in a year. Again if a grower begin a snail farm with 50 snails, it can produce averagely up to 250,000 adult snails worth over five million naira in a year this is a real export market that earns foreign revenue without you running from pillar to pose. Snail farming is a GEM in the kingdom, it will level other livestock importation because one can conveniently earn income a thousand fold higher than your present earning.

4.22. THE MAJOR SETBACKS

The demand for snail meat and shell is higher than the supplies as such the market potential of sadly, Nigerian inclination to go into business in the fields where thousands have already made their fortune has led to the after neglect of such lucrative area of snail farming in the country or export at international market. Also, the development of urban centers and the inability of people to seek to learn modern ways of cultivating snails are the greatest challenges confronting the business.

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APPENDIX I: NUTRITIONAL VALUE OF SNAIL

List of nutrients and their contents in raw, snail. Nutrient values and weights are for edible portion

NUTRIENTS	UNITS	CONTENT/100 GRAIN SNAIL
Water	G	79.20
Energy	Kcal	90
Energy	Kj	377
Protein	G	16.10
Total lipid (fat)	G	1.40
Ash	G	1.30
Carbohydrate by difference	G	2.00
Fibre, total dietary	G	0.0
Sugar, total	G	0.00
Minerals		
Calcium Ca	Mg	10
Iron, Fe	Mg	3.50
Magnesium, Mg	Mg	250
Phosphorus, P	Mg	272
Potassium, K	Mg	382
Sodium, Na	Mg	70
Zinc, Zn	Mg	1.00
Copper, Cu	Mg	0.400
Selenium, Se	Mcg	27.4
Vitamin C, total ascorbic acid	Mg	0.0
Thiamin	Mg	0.010
Riboflavin	Mg	0.120
Vitamins		
Niacin	Mg	1.400
Vitamin B-6	Mg	0.130
Folate, total	Mg	6
Folic acid	Mg	0
Folate, food	Mcg	6
Folate, DFE	mcg-DFE	6
Vitamin B-12	Mcg	0.50
Vitamin B-12, added	Mcg	0.00
Vitamin A, IU	Iu	100
Vitamin, A,RAE	mcg-RAF	30

Retinol	Mcg	30
Vitamin E (alpha tocopherol	Mg	5.00
Vitamin E, added	Mg	0.00
Vitamin K (phylloquinone)	Mcg	0.1
Lipids		
Fatty acid, total saturated	G	0.361
4:0	G	0.000
6:0	G	0.000
8:0	G	0.000
10:0	G	0.000
14:0	G	0.056
16:0	G	0.249
18:0	G	0.051
Fatty acid, total monounsaturated	G	0.259
16: 1 undifferentiated	G	0.048
18:1 undifferentiated	G	0.211
20:1	G	0.000
22:1 undifferentiated	G	0.000
Fatty acids, total polyunsaturated	G	0.252
18:2 undifferentiated	G	0.017
18:3 undifferentiated	G	0.000
18:4	G	0.015
20:4 undifferentiated	G	0.000
20:5 n-3	G	0.119
22:5 n-3	G	0.099
22.6 n-3	G	0.000
Cholesterol	Mg	50
Other		
Alcohol, ethyl	G	0.0
Caffeine	Mg	0
Theobromine	Mg	0
Carotene, beta	Mcg	0
Carotene, alpha	Mcg	0
Cryptoxanthin, beta	Mcg	0
Lycopene	Mcg	0
Lutein + zeaxanthin	Mcg	0

The following nutrient data above was obtained from the USDA National Nutrient standard reference (2006).

APPENDIX II: FINANCIAL PROJECTIONS

CALCULATION FOR INDIRECT COSTS CHARGE

Indirect costs charge = total indirect cost/month divided by Total direct material cost/month

From the labour cost form above,

$$\text{Indirect cost charge} = \text{₦ } 13500 / \text{₦ } 164740 \times 100 = 8.2\%$$

To cover up the total indirect costs for the business, 8.2% has to be added to the direct material costs of each material. This will be work out in the production costing form as shown below:

PRODUCTION COSTING FORM

	1	2	3
Product	Direct material cost/month ₦	Indirect cost/item (col. 1x8.2/100) ₦	Total cost/item (col. 1x col. 2) ₦
Breeds of snails	10	(10x8.2/100) = 0.82	8.2
Plastic aquarium	450	(450x8.2/100) = 36.9	166605
Manuel water sprinkler	680	(680x8.2/100) = 55.76	37916.8
Sponge or rag	150	(50x8.2/100) = 12.3	1845
Pebbles holes	450	(450x8.2/100) = 36.9	16605
Cactus flowerpot	700	(700x8.2/100) = 57.4	40180
Humus-rich soil	450	(450x8.2/100) = 36.9	16605
Ashtray or snail plastic box	260	(380x8.2/100) = 31.16	118408

CASH FLOW PROJECTIONS

The financial projection is for a period of five year as shown below. Starting from year 1st through year 5.

Cash flow plan

S/N		1 st year	2 nd	3 rd	4 th	5 th
1	Cash at the start of the year	240487.7	150000	132000	100000	200000
2	Cash in from sales	564000	345000	263000	250000	541000
3	Any other cash in	-	-	-	-	-
4	TOTAL CASH IN	804487.7	495000	395000	350000	741000
5	Cashout for direct material cost	164740	102000	100000	98000	110000
6	Cashout for indirect labour cost	50300	50300	50300	50300	50300
7	Cashout for indirect cost	13500	13500	13500	13500	13500
8	Cashout for planned investment eqn	6400	-	-	-	-
9	Any other cash out	6000	-	2000	-	-
10	TOTAL CASH OUT	298540	165800	165800	161800	175300
11	CASH AT THE END OF THE YEAR	505947.7	329200	229200	188200	565700

Note: Cash at the end of the year = total cash in – total cash out
= ₦ 804487.7 - ₦ 298540 = ₦ 505947.7

- Hence, the first years estimate sales and net profit is ₦ **505947.7** for year 1.
- The second year's estimated sales and net profit is ₦ **329200** for year 2.
- The third year's estimated sales and net profit is ₦ **229200** for year 3.
- The fourth year's estimated sales and net profit is ₦ **188200** for year 4.
- The fifth year's estimated sales and net profit is ₦ **5565700** for year 5.

This cash flow projection indicates that I cannot run out of cash at any period or year in the business.

CALCULATION FOR NET PRESENT VALUE (NPV)

Now, assume that the snail farm business cost ₦250, 000 and is expected to generate yearend cash inflows of ₦500000, ₦400000; ₦300000, ₦200000 and ₦100000 in years 1 through 5. And the opportunity cost of capital is assumed to be 10%.

YEAR	CASH FLOWS	PVF	PV
0	(250)	1.000	(250)
1	500	0.909	454.5
2	400	0.826	330.4
3	300	0.751	225.3
4	200	0.683	136.6
5	100	0.621	62.1
NPV			₦958.9

= #958900

- The NPV of cash inflows (₦ 958900) is greater than that of the cash outflows (₦ 250000).

Thus, it generates a positive NPV of ₦ 958900.

The business adds to the wealth of owner and therefore, it was accepted.

SENSITIVITY ANALYSIS

This is the method of recalculating NPV or IRR by changing each forecast. For example, let us assume that the cash inflows fall by 15%.

NPV SENSITIVITY AT 15% (₦'000)

YEAR	CASH FLOWS	PVF	PV
0	(250)	1.000	(250)
1	425	0.909	386.325
2	340	0.826	280.84
3	255	0.751	191.505
4	170	0.683	116.11
5	85	0.621	52.785
NPV			₦777565

Note: the NPV of cash inflows (₦ 77565) is greater than that of cash outflows (₦ 250000). Thus, it generates a positive NPV of ₦777565, implying that the business adds to the wealth of the owner(s) and therefore, it was accepted.

IRR CALCULATION (#'000)

YEAR	CASH FLOW	DR=20%	PV	DR=16%	PV	DR=15%	PV
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			(2)x(3)		(2)x(5)		(2)x(7)
0	(250)	1.000	(250)	1.000	(250)	1.000	(250)
1	500	0.833	416.5	0.862	431	0.870	35
2	400	0.694	277.6	0.743	297.2	0.756	302.4
3	300	0.579	173.7	0.641	192.3	0.658	197.4
4	200	0.482	96.4	0.552	110.4	0.572	114.4
5	100	0.402	40.2	0.476	47.6	0.497	49.7
NPV			754.4		828.5		848.9

Now, PV required = ₦250, 000

PV at lower rate (15%) = ₦ 1098900 PV at higher rate (16%) = ₦ 1078400

Difference between PV required and PV at lower rate divided by
Difference between PV at lower rate and PV at higher rate

$$= \frac{\text{₦ } 250000 - 1098900}{\text{₦ } 1098900 - 1078500} = \frac{-\text{₦ } 848900}{\text{₦ } 204000} = -\text{₦ } 41.61$$

$$\therefore r = 15.00\% + \frac{(16\% - 15\%) - 848900}{20400} \quad r = 15.00\% + 41.61\% = -26.1\%$$

Thus, - 26% is the business IRR which equates the initial cash outlay of ₦ 250000 with the constant annual cash inflows of ₦500000, ₦400000, ₦300000, ₦200000, and ₦100000 for 5 years.

PROFITABILITY INDEX, PI

This method of evaluating investment is also called Benefit-cost Ratio (BCR). The acceptance rule is as follows;

- Accept if PI is greater than 1
- Reject if PI is less than 1
- May accept if PI = 1

By using the 10% rate of discount, PI is calculated thus:

P1 OR BCR calculation (₦'000)

YEAR	CASH FLOWS	PVF	PV
1	300	0.909	454.5
2	400	0.826	330.4
3	300	0.751	225.3
4	200	0.683	136.6
5	100	0.621	62.1
NPV			₦1208900

Now, to calculate the PI or BCR: =

$$\frac{\text{PV of cash inflows}}{\text{Initial cash outlay}} = \frac{1208900}{250000} = \text{₦ } 4.8$$

By the acceptance criteria, this business was accepted because the PI (BCR) is greater than 1.

PAYBACK PERIOD (PB)

For business that generates constant annual cash inflows, the payback period (PB) can be calculated thus:

$$\text{PB} = \frac{\text{initial investment}}{\text{Annual cash inflow}}$$

The acceptance rule is as follows:

- If the PB is less than the maximum or standard PB set by management, it would be accepted and if not, it would be rejected.
- As a method of ranking, it would accept the project with the shortest PB. Now, recall that for the third year, the PV of cash inflows at 16% rate of discount was calculated as ₦229200 and the initial business outlay was at ₦240489.7. Therefore,

$$\text{PB} = \frac{\text{₦ } 240487.7}{\text{₦ } 229200} = 1.05 \text{ years.}$$

By the acceptance rule, the PB is less than the maximum or standard PB set by management and therefore, it was accepted. The business will pay all its debts in the first year.

DISCOUNTED PAYBACK PERIOD (DPB)

This is the number of period, taken in recovering the investment outlay on the present value basis. Note: The DPB fails to recognize the cash flows accruing after the PB.

Calculation for DPB at 10% PVF (#'000)

YEAR	CASH FLOWS	PVF	PV
0	(250)	1.000	(250)
1	500	0.826	413
2	400	0.751	300.4
3	300	0.683	204.9
4	200	0.621	124.2
5	100	0.564	56.4
PB		1 year	
DPB			1.3 years
NPV			848900

ACCOUNTING RATE OF RETURN (ARR)

The ARR is also known as the return on investment (R01). This uses accounting information, as revealed by the financial statement to measure the profitability of an investment.

The ARR (R01) was found out by dividing the average after-tax profit by the average of the average investment.

Thus, $ARR (R01) = \frac{\text{Average income}}{\text{Average investment}}$

The acceptance criteria are that:

- Accept the project whose ARR (R01) is higher than the minimum rate established by management
- Reject projects with ARR (R01) less than the minimum rate

CALCULATION OF ARR (R01)

Period	1	2	3	4	5	Average
Nasir	10,000	12000	14000	16000	20000	14400
Depreciation	8,000	8000	8000	8000	8000	8000
Lesoy	2,000	4000	6000	8000	12000	64000
Taxes (50%)	1000	2000	3000	4000	6000	32000
Mdal	1000	2000	3000	4000	6000	32000
Investment - B	4000	32000	24000	16000	8000	
Investment - E	32000	24000	16000	8000	0	
Investment -A	36000	28000	20000	12000	4000	20000

∴ ARR or ROI = $3200 \times 100 / 20000 = 16\%$, the business was accepted.

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