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Ghardaïa University



**GREEN
COCOON**
BE A PART OF THE
SOLUTION

Ghardaïa University Incubator



**GREEN
COCOON**
BE A PART OF THE
SOLUTION

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**The effectiveness of relying on
green cocoons on the environment and
the economy in dry areas**

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Abstract:

This study explores the use of green cocoon technology as an innovative solution for agricultural challenges in arid regions, which are characterized by severe water scarcity and difficulty sustaining agricultural productivity. The green cocoon, made from a biodegradable shell, is designed to supply water and essential nutrients directly to plant roots, reducing the need for frequent irrigation and improving plant survival rates. Field experiments have demonstrated the green cocoon's effectiveness in reducing water usage, enhancing soil fertility, and lowering production costs, while also contributing to ecosystem stability in arid areas and promoting the sustainable use of local resources. Additionally, the study highlights the economic and social impacts of this technology, as it creates job opportunities, supports food security, and fosters rural community development. The study recommends the widespread adoption of this technology in Algeria, especially within reforestation programs, to combat desertification and support sustainable development.

Keywords:

Green Cocoon Technology, Arid Regions, Water Conservation, Plant Survival, Soil Fertility, Sustainable Agriculture, Ecosystem Stability, Rural Development, Food Security, Desertification, Reforestation, Algeria.

Résumé:

Cette étude explore l'utilisation de la technologie des cocons verts comme solution innovante aux défis agricoles dans les régions arides, caractérisées par une forte pénurie d'eau et des difficultés à maintenir la productivité agricole. Le cocon vert, constitué d'une enveloppe biodégradable, vise à fournir directement de l'eau et des nutriments essentiels aux racines des plantes, réduisant ainsi la nécessité d'arrosages fréquents et augmentant les taux de survie des plantations. Les expériences de terrain ont démontré l'efficacité des cocons verts pour réduire la consommation d'eau, améliorer la fertilité des sols et diminuer les coûts de production, tout en contribuant à la stabilité des écosystèmes et à la durabilité des ressources locales dans les zones arides. De plus, l'étude souligne les impacts économiques et sociaux de cette technologie, notamment en créant des opportunités d'emploi, en soutenant la sécurité alimentaire et en favorisant le développement des communautés rurales. L'étude recommande l'adoption généralisée de cette technologie en Algérie, notamment dans les programmes de reboisement, afin de lutter contre la désertification et de promouvoir un développement durable.

Mots-clés :

Technologie des Cocons Verts, Régions Arides, Conservation de l'Eau, Survie des Plantes, Fertilité des Sols, Agriculture Durable, Stabilité des Écosystèmes, Développement Rural, Sécurité Alimentaire, Désertification, Reboisement, Algérie.

الملخص :

تتناول هذه الدراسة مشروع استخدام تكنولوجيا الشرنقة الخضراء كحل مبتكر لتحديات الزراعة في المناطق القاحلة، حيث تنقسم هذه المناطق بنقص شديد في الموارد المائية وصعوبة استدامة الإنتاج الزراعي. تهدف الشرنقة الخضراء، التي تتكون من غلاف قابل للتحلل الحيوي، إلى توفير الماء والعناصر الغذائية للنبات مباشرة عند الجذور، مما يحد من الحاجة للري المتكرر ويزيد من فرص بقاء النباتات. من خلال التجارب الميدانية، أثبتت الشرنقة الخضراء فعاليتها في خفض استهلاك المياه، وتعزيز خصوبة التربة، وتقليل تكاليف الإنتاج، كما تساهم في استقرار النظام البيئي للمناطق الجافة ودعم استدامة مواردها. إضافة إلى ذلك، تسلط الدراسة الضوء على الأثر الاقتصادي والاجتماعي لاستخدام هذه التقنية، حيث يمكن أن توفر فرص عمل، وتدعم الأمن الغذائي، وتساهم في تنمية المجتمعات الريفية. توصي الدراسة بتعميم هذه التكنولوجيا في الجزائر، وخاصة في برامج إعادة التشجير، لمواجهة التصحر وتحقيق التنمية المستدامة.

الكلمات المفتاحية:

تكنولوجيا الشرنقة الخضراء، المناطق القاحلة، ترشيد استهلاك المياه، بقاء النباتات، خصوبة التربة، الزراعة المستدامة، استقرار النظام البيئي، التنمية الريفية، الأمن الغذائي، التصحر، إعادة التشجير، الجزائر.

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General Introduction

Over the last decade, the worldwide problem of desertification and limited availability of fresh water has been gaining significance, especially in arid and semi-arid areas. These adverse environmental conditions degrade inhabited environments, destabilize ecosystems surrounding populated territories, and severely affect the stability of agricultural production. This, in turn, jeopardizes the existence of communities heavily engaged in farming. Traditional agricultural practices, such as irrigation and tilling, contribute significantly to the depletion of water resources and the poor quality of soil. Hence, there is an urgent need for new solutions that increase the popularity of sustainable agricultural systems to ensure the proper utilization of limited resources while maintaining or even surpassing current productivity rates.

One such innovation is the use of green cocoons – a groundbreaking technique in the horticultural world that utilizes a biodegradable shell to deliver water and nutrients directly to the root of the seedling. This technique significantly reduces water usage, enhances plant survival rates, and improves soil conditions without the need for repeated fertilization and irrigation. The research presented in this thesis focuses on the effectiveness of green cocoons in promoting environmental sustainability and economic stability in dry regions threatened by desertification and water scarcity.

This study is particularly crucial given the vulnerability of dry agricultural lands and the increasing recognition of environmentally friendly farming practices. By assessing the efficiency of green cocoons, the research aims to highlight their contribution to both environmental sustainability measures and economic stability. The primary objective is to evaluate the potential benefits within the natural environment, such as conserving water and enhancing soil fertility, and to examine the socioeconomic impacts, including the economic viability of farming practices using this technology and the potential increase in farmer income. Furthermore, this research aims to provide a comprehensive analysis of how green cocoon technology can revolutionize agriculture in dry areas. By highlighting the environmental and economic dimensions of this innovation, the study seeks to advance knowledge in environmental science and agricultural economics. It also aims to offer practical recommendations that will benefit communities facing one of the most disastrous phenomena of climate change: desertification.

first axis

Project Itroduction

Introduction

Over the last decade, worldwide problem of desertification and limited availability of fresh water has been gaining its significance, especially in arid and semiarid areas. In addition to degrading the inhabited environment and destabilizing the ecosystems surrounding the populated territories, adverse environmental conditions affect the stability of agricultural production and thus jeopardize the existence of communities that are heavily engaged in farming. This is because most of the traditional practices in agriculture such as irrigation and tilling, contribute to the depletion of water resources and poor quality of soil. Hence, CoLs require new solutions to increase the popularity of sustainable agriculture systems that will ensure proper utilization of limited resources to deliver or surpass the current productivity rates.

One such innovation is the use of green cocoons – an innovative technique in horticulturist’s world which uses a biodegradable shell that enjoins water and nutrients to the root of the seedling. It holds the ability to cut water usage massively, increase the survival rates of plants and improve the state of the earth without the repeated usage of fertilizer and irrigation. This research is particularly important due to the vulnerability of dry agricultural lands and the increasing recognition of the need for environmentally friendly practices in farming, thus the reason for this thesis, which is aimed at assessing the efficiency of green cocoons

It is a significant thesis and the main rationale for this research is to focus on the contribution of green cocoons to environmental sustainability measures and economic stability in degraded areas, especially arid regions that are threatened by desertification and scarcity of water and this study will advance knowledge about environmental science and agricultural economics with appropriate recommendations that will benefit those communities threatened by one of the most disastrous phenomenon of climate change; deserts. . These involve evaluating the potential benefits within the natural environment for instance the ability to conserve water and enhance the fertility of the soil but also examining the socioeconomic factors for example whether the given technology makes farming more economical and or if it has the potential to increase production per farmer thus their income. By highlighting these dimensions of change, the study would provide a systemic analysis that will help evaluate the possibilities of green cocoon technology to revolutionise agriculture in dry areas.

This decision creates a valuable context for the elaborate exploration of emerging farming technologies that can transform agricultural practices in some of the Earth’s most sensitive zones.

1-Project Idea**✓ Field of Activity: Sustainable Agriculture**

Sustainable agriculture means farming sustainably and can be defined as functioning within the capabilities of natural ecosystems or the natural environment without depleting it, or as farming in a manner that does not harm land regarding productivity, water quality and other resources.

in Arid Environments Origination and Development of the Idea: The initial concept of developing green cocoon technology emerged as a response to three key concerns that affect arid regions: lack of water and unsustainable farming techniques. This technology was initiated jointly as an environmental science, agronomy, and engineering project, which produced a water-saving capsule containing the necessary nutrients for the plant the roots could absorb.

✓ Project Actions:

To validate green cocoon envelop technology, a controlled nursery environment will be adopted at the University of Ghardaïa.

The setting up of test and control plots, incorporating the cocoons with the chosen drought tolerant plants, and the measurement of growth attributes as well as climatic conditions are in line with the project.

✓ **Execution Method:** It remains the green cocoons project has a comparative research plan to consider using the green cocoons against common planting practices regarding the use of water and the condition of the soil and the health of some of the plants that are being planted using this method. Efficiency in the collection of data shall be keen and it shall involve the use of appropriate technology in tracking environmental effects and the growth of the plant.

✓ **Project Team:** In this context, and as part of the decentralized cooperation project with the High-Commissionership of the Grand-Oasis region in Algeria, the implementation of the project will be ensured with the participation of a team of the University of Ghardaïa students with the technical support of specialists in the new agricultural technologies and the sustainable development.

✓ **Location:** The testing and implementation will occur in nursery facilities located at the University of Ghardaïa campus in a geographic area that is demonstrative of the types of arid climates where such technology may pose notable effects.

2-Suggested values**✓ Cost Reduction:**

- If we use recycled cardboard in green cocoons as one of materials then we may find out that raw material cost will be cheaper than that of new or virgin material. Cardboard is very much easily availed and sometimes they are found cheaper as compared to the local market since they can be obtained from the recycling centres.

✓ Novelty:

- Green cocoon technology offers a novel approach to planting in arid regions by providing a biodegradable capsule that efficiently delivers water and nutrients directly to the plant's roots. This innovation addresses the unique challenges of desert agriculture, where traditional methods fall short.

✓ Performance:

- Due to improvement in plant survival rates, water consumption and the fertility of the soil it can be formative that green cocoons will actually surpass conventional farming methods in arid regions.

✓ Adaptation Flexibility:

- The factors discussed above indicate that the technology can be readily applied across different types of plants and climate. More studies can be done to modify the contents of the cocoons and perhaps the sizes as well with specific types of animals to fit the conditions of growth and breeding in optimum ways.

✓ Accomplishing the Task:

- Through green cocoon technology, the clients especially those farmers and the farming related businesses it will be very useful in enhancing their objectives of achieving high yields through efficient resource conservation. The effectiveness of the technology is intended to complement the requirements of the environmental conditions of the arid climatic zones and agricultural production needs.

✓ Price:

- This technology is recommended to have reasonable price tag so that such farmers could

find it as a suitable solution to high water usage and poor crop yields in a tough environment.

✓ **Reducing Risks:**

- Green cocoons minimize the chances of failure in cropping due to water stress or inadequate irrigation in that they deliver water directly at the plant roots. On the same note, the natural and biodegradable materials used, also help in reducing the impact on the environment and human health, caused by hazardous chemicals.

✓ **Accessibility:**

- This innovation enhances efficiency in farming and use of water in the dry areas hence making sustainable farming standards easier for farmers to use especially for those who in the past did not have feasible or effective ways of doing so. Another advantage of such system is about the development potential of arid and semi- arid regions with environment and economy friendly approach.

✓ **Convenience and Ease of Use:**

- Green cocoons simply have to be placed into use and once in place there is very little that the farmer needs to do, in order to maintain them. Because their design and use do not always require dramatic alterations to normal organizational practices and skills and technical expertise, they are fairly easy to apply.

✓ **National Reforestation Programs:**

- Due to the importance of the forests in maintaining the ecological balance and low afforestation rate, the Algerian government has encouraged the initiation of afforestation projects and other programs aimed at raising the rate of afforestation. They include measures to enhance afforestation; regain the lost vegetation cover, and fight climate change globally.

Algeria needs to modernize their agriculture and the green cocoon technology is excellent for application in this country. That is the technology of pumping water forth from the ground for young trees to be planted and ensure that they do not dry up, which is in consonant with the governments' agenda in ensuring environmentalism and combating desert lynching.

3-work team**1. Bermane Nail Mouad**

- Experience: Nail Mouad has extensive experience in large-scale crop farming, installation of center pivot irrigation equipment, well drilling, as well as expertise in strategic crop cultivation and working in agricultural consultancy offices.

- Role in the Project: Nail Mouad is responsible for designing and developing the environmental and agricultural technologies for the Green Cocoon, overseeing the pilot model, and monitoring its progress.

2. Oulad Laid Abdelkader

- Experience: Abdelkader has vast experience in engineering design and design software.

- Role in the Project: Abdelkader is responsible for theoretical analysis and monitoring the structures of the Green Cocoon, ensuring efficient resource and energy utilization.

4-Goals and Scope of the Project in Relation to Business Motives

1. Short-term Objectives (1-2 Years):

Market Entry and Education: All said, for the green cocoon technology launching; important on the matter is that, the market ought to be educated concerning its advantages. Currently, there is none that has been presented as a closing competitor, and, thus, the primary goal is to increase people's recognition of such a decision-making tool.

Establishment of Market Presence: The strategy for choosing the correct market segment to begin with is targeting early adopters; the desired position for the first year is 40%. Lack of direct competitors extends the time to establish brand recognition and loyalty to the company and its products and services.

2. Medium-term Objectives (3-5 Years):

Market Expansion and Leadership: Market share is increased to 75% of the overall market, largely due to the success of the first customers to use the products. The cocoons produced in a green way will be marketed to a wider audience while the targeted market increases its consistencies among large scale commercial farms.

Product Diversification: Derivatives of the product are brought out, fitted into various contexts of the crop type and weather, making the technology more flexible in the various situations in farming.

Strategic Partnerships: There are partnerships with the agricultural associations and large farming bodies, non-profit organizations aiming at sustainable production, and government agencies in order to advance the large scale utilization and potentially have access to subsidies or grants.

3. Long-term Objectives (5+ Years):

Market Dominance: The brand is formulated as the brand in this niche, realizing sustainable agricultural technologies in arid area hence vision of the growth of the market share to a 100%.

Global Expansion: The utilisation escalates globally, targeting countries facing similar issues like water shortage and subdued soil quality.

Strategies for a Market without Competitors

- **Educational Marketing:** Campaigns are focused on highlighting the problem-solution dynamic of water scarcity and how green cocoon technology effectively addresses this issue. Demonstrations, trials, and case studies are used to illustrate the benefits.

- **First-Mover Advantage:** The advantage of being the first on the market is utilized to build a strong brand that is synonymous with innovative, sustainable agricultural solutions. Patents are secured, if applicable, to protect the technology.
- **Value Proposition:** The multiple benefits of the technology are clearly articulated—not just its sustainability and efficiency in water use, but also its cost-effectiveness over time, ease of use, and compatibility with existing farming practices.
- **Feedback Loops:** Strong feedback mechanisms with early users are established to refine and improve the product. This customer-driven innovation helps tailor the technology to better meet the needs of various user groups.

5-Timeline for project realization

Quarter	Preliminary Studies	Request Equipment	Building Production HQ	Equipment Installation	Purchasing Raw Materials	Begin Production
Year 1 - Q1	✓					
Year 1 - Q2	✓	✓				
Year 1 - Q3		✓	✓			
Year 1 - Q4			✓			
Year 2 - Q1				✓		
Year 2 - Q2				✓	✓	
Year 2 - Q3					✓	✓
Year 2 - Q4						✓

Table 1: Timeline for project realization

Source: Prepared by the students

The previous table shows a timeline for implementing the Green Cocoons technology project, which extends from the first quarter of the first year to the fourth quarter of the second year. The following is an analysis of the various activities shown in the table and their importance:

Schedule activities:

Preliminary studies (first year - first quarter)

Activity: Conducting preliminary studies.

Importance: This initial stage is crucial to understanding the feasibility and foundation planning of the project. It includes research, data collection, and analysis to ensure the feasibility of the project and determine detailed plans.

Equipment Order (Year 1 - Q2)

Activity: Ordering and supplying the necessary equipment.

Importance: Identifying and purchasing the right equipment is essential to the success of the project. This phase includes selecting suppliers, negotiating terms, and ensuring that the equipment meets the project's technical specifications and sustainability standards.

Headquarters Building Production (Year 1 - Quarter 3)

Activity: Establishment of production headquarters.

Importance: Establishing a production headquarters is essential to centralize operations, facilitate coordination, and enhance productivity. This phase ensures that the necessary infrastructure is in place to support subsequent project activities.

Equipment Installation (Year 1 - Fourth Quarter)

Activity: Installation of purchased equipment.

Importance: Proper installation of equipment ensures that production operations can begin smoothly. This step is necessary to avoid delays and technical issues that may arise from incorrect setup.

Purchase of raw materials (second year - first quarter)

Activity: Purchasing raw materials for production.

Importance: Obtaining high quality raw materials is vital to produce effective green cocoons. This phase involves securing materials that meet sustainability standards and negotiating with suppliers to ensure consistent supplies.

Start of production (second year - second quarter and third quarter)

Activity: Starting to produce green cocoons.

Significance: The start of production represents a major milestone, translating planning and preparation into tangible deliverables. This stage tests the efficiency of the production process and allows for any necessary adjustments to be made to improve production.

Continuous production (second year - fourth quarter)

Activity: Maintaining and expanding production.

Importance: Ensuring continuous production is key to meeting market demand and achieving project objectives. This phase focuses on scaling up operations, maintaining quality, and managing distribution logistics.

Comontary:

The timeline for the Green Cocoon Technology project highlights the level of organization and meticulous planning undertaken by the team to achieve the project's goals. The stages begin with preliminary studies, underscoring the importance of thoroughly understanding the project's feasibility before moving on to the execution phases. This is followed by equipment requests and the construction of the production headquarters, crucial steps to ensure the necessary infrastructure and equipment are in place. As the project progresses into the second year, the focus shifts to equipment installation and the purchase of raw materials, ensuring that everything is ready for the actual start of production as scheduled. This timeline reflects a strategic and methodical approach to project management, enhancing the chances of success and minimizing risks of delays or failures. It also demonstrates how financial and human resources are effectively managed to ensure the achievement of the desired objectives. In summary, the timeline is not just an execution plan but a testament to the professionalism and thorough preparation that reflects the team's commitment to achieving the project goals efficiently and effectively.

Second axis

Innovative aspects

1- The nature of innovation

The nature of innovation in the context of the green cocoon technology project, which incorporates recycled cardboard, can be described along several dimensions: The nature of innovation in the context of the green cocoon technology project, which incorporates recycled cardboard, can be described along several:

1.1 Technological Innovation:

- , but the actual concept behind green cocoon technology is quite groundbreaking as a technological step forward in sustainable farming. This invention threatens standard practices of irrigation and planting in deserts as it creates a self-contained growing condition for seedlings in regions where rainfall is scarce thus minimizes on water utilization as well as increases germination success rates.

1.2 Material Innovation:

- Another feature of innovation can be noted in the organic and sustainable nature of the cocoon; the use of cardboard derived from recycling is applied here. It not only helps to require the waste material in the manufacturing process and carves a niche for the concept of circular economy utilization but also adds up to the sustainability quotient of the product. It presents an option that is somehow sustainable to usual materials that might be less degradable or those ones that demand more raw materials in their production.

1.3 Process Innovation:

- Laying down the principles on how to turn old cardboard into a marketable agricultural product is a key process innovation. It probably entails new methods of processing, moulding, and assembling material to design the final product for the utility it aims to deliver besides the long-term viability of the product in its lifespan.

1.4 Business Model Innovation:

- It may mean changes in business strategies; one way can be to become an affiliate of a recycling firm to obtain raw materials, or to use the green cocoon technology as a service, where the technology is part of the holistic solution for sustainable agriculture that can come with technical assistance and other services.

1.5 Market Innovation:

- Thus, by not having direct competitors for this particular product type, establishing green cocoon technology as a product helps develop a new marketplace segment. It creates the possibility for metrics relating to the sustainability of agriculture to be defined and incorporated into the overall set of market norms and guidelines.

1.6 Social Innovation:

- However, the social repercussions seem to be an unintended yet positive by-product of the project that attempts to enhance the profitability and efficiency of agriculture in dry areas. That is, it can enhance the social wellbeing at the community level, add to the food security and operate social change on the aspect of treasuring the environment besides advocating for sustainability.

2-Areas of innovations

The green cocoon project exemplifies innovation across multiple facets of agricultural technology and business. Below are paragraphs that explore the inventive elements in each of the areas mentioned:

✓ Inventions in New Operations:

The introduction of green cocoon technology streamlines agricultural operations in arid regions, potentially increasing profitability. By reducing water usage and labor costs associated with traditional planting methods, operations become more efficient. Furthermore, the manufacturing process of the cocoons, particularly the inclusion of recycled cardboard, introduces new operational techniques that optimize the use of resources, thereby increasing operational effectiveness and reducing costs.

✓ Inventions in New Experiences:

Implementing this technology enhances the customer experience by offering more value to existing customer segments. This positive experience can drive customer loyalty and increase sales within existing market segments. Moreover, the educational components of the project can enrich the customer experience by empowering them with knowledge and skills in sustainable farming practices.

✓ Inventions in New Features:

The project brings forth new features such as the sustainable and gradual water release mechanism of the green cocoons and the integration of biodegradable materials. These features represent an improvement in the provision of agricultural services and products, directly impacting the efficiency and yield of farming operations in dry regions.

✓ Inventions in Customers:

By targeting a range of customers from small-scale farmers to large agricultural enterprises, the project follows the trajectory of its product's application. Furthermore, the innovation can extend to customers of dependent customers—such as food processors and retailers—who benefit from the increased quality and sustainability of the crops produced with the green cocoons.

✓ Inventions in Creating New Perspectives:

The green cocoon technology has encouraged the development of more unique outlooks to sustainable agriculture since the attachments proved that it is possible to keep productivity in scarcity of water and preserve the natural resources. This refocuses the debate on sustainable farming within dry countries and disseminates different ways of farming which are less damaging for the environment.

✓ Inventions in Changing the Approved Business Model:

In these ways, the green cocoon project can fix not only the agricultural practices in the dry areas but also takes place in creating a systemic shift in the approach of agricultural businesses, focusing on sustainability and effectiveness.

Third axis

Strategic market analysis

1-View the market sector

Below is the revised and structured presentation of the potential market for green cocoon technology: Below is the revised and structured presentation of the potential market for green cocoon technology:

Presentation of potential market

1.1 Who buys our products?

The main buyers of green cocoon technology are likely to be::

- It aims at exerting influence on the farmers and agricultural as well as non-agricultural firms located in the arid and semi-arid regions.
- Governmental organizations include:
 - for Ministry of Agriculture, Rural Development and Fisheries.
 - National Agency for the Legislative Regulation of the Ministry of Environment and Renewable Energy
 - Forest Governorate
 - Aquatic organisms Agency in Eastern region:
 - the National Authority for Land and Rural Development
 - National water management authority
 - The projects associated with Rural Development and Agriculture Foundation
- It involves and appeals to non-governmental organizations as well as major investing parties that take part in Agricultural development and sustainability.
- Notably, organizations warranting research in the field of agriculture and innovation and environmental sustainability include research institutions, and universities.

1.2 How or why was this done?

The main motivations for purchasing green cocoon technology include: The main motivations for purchasing green cocoon technology include:

- The irrigation water scarcity and necessary reductions of irrigation water usage together with the importance of maintaining vegetation in water-deficit environments
- the need to increase yields due to high crop mortality, and to work on the soil in a sustainable and

eco-friendly manner without the overuse of chemicals.

- The challenges facing the natural environment and the growing incline towards the use of sustainable and environmentally friendly approach to farming and food production.
- Optimization of seedling management by offering a range of services, which saves time and effort, especially during the first days and weeks of seedling development.

1.3 Where are they located?

Potential customers are mainly located in:

- Specifically, the climatic conditions of Algeria whereby some regions suffer serious problems in water shortages which leads to desertification.
- Further afield, other parts of Africa and the Middle East will remain promising markets in the future.
- Pitches for areas where environmental conservation and innovation in farming method is valued and encouraged.

The revival of the Green Dam initiative, which aims to help Algeria combat desertification, confirms the local commitment to these technologies.

1.4 Competition in the market:

While traditional agricultural practices may serve as indirect competitors, the green cocoon technology market currently has no direct competitors. This represents a unique opportunity for market entry and expansion, allowing the technology to establish a strong foothold without the challenge of displacing existing products.

1.5 Possibility of purchase contracts

- There is great potential to secure purchase contracts with:
 - Governmental and non-governmental organizations that aim to enhance vegetation, combat desertification, and promote sustainability in vulnerable areas.
 - Agricultural extension services, through partnerships that can demonstrate the benefits of technology to a wider audience.
 - International development agencies focused on food security and sustainable agricultural practices.

2-Measuring the intensity of competition

Market competition defines the measures of competing directly and indirectly when introducing a new product such as green cocoon technology into the market. Consequently, competition for green cocoon technology which specialises in arid and semi arid regions may be of a different nature and not as intense as in other markets. Below is an analysis of the competitive landscape:

➤ **Direct competitors:**

- Direct Competitors: As identified in the previous sections, there are still no direct competitors offering a similar Green Cocoon technology, thus the advantage that lies in this product. However, new inventions or innovations in sustainable agronomical activities and technologies are likely to challenge this position once they develop new products in the market.

➤ **Indirect competitors:**

- Traditional agricultural practices: Services comprise of Set-Top-Box based traditional irrigation practices like Drip irrigation, Water sprinkler systems and manually Controlled irrigation systems which are age old techniques from the agricultural areas of the target regions.

- Emerging Sustainable Agricultural Innovations: If they deliver products that could increase water use efficiency and improve crops resilience then they are also indirect competitors to startups and existing companies that have embarked on aggressive research and development in sustainable technologies via investing in agriculture.

➤ **Number and market shares:**

- Traditional Practices: All of them are well-known and can rightly be considered defining the priority market share throughout their long functioning and popularity among farmers.

- Water Saving Technologies and Innovations: But they are becoming popular gradually because more maturing like the following solutions that are more specialized in this problem area due to scarcity of water.

ts market share is increasing, but it is not as important as traditional methods.

- Emerging Innovations: Because this is a rapidly evolving field, it can be difficult to determine exact market shares for emerging technologies, but they are currently small but growing.

➤ **Strengths and weaknesses of competitors:**

strength point:

- **Traditional practices:** are well established, widely trusted and supported by existing infrastructure.

- **Emerging innovations:** High innovation potential, often supported by research and development, and increasingly supported by environmental policies and subsidies.

- **Traditional practices:** are generally characterized by inefficiency in water usage, and most are unsustainable in the long end they cause high levels of salinity as well as other problems that affect the health of our soils.

- **Other water saving techniques:** Some may be costly, needs a large capital when being purchased or some may not be compatible with all crops and types of soils.

- **Emerging innovations:** Some of the challenges are as follows The society has been unable to penetrate deep into the market due to high initial costs for research and development which it was unable to foresee. There are also traditional farmers who are not receptive to these new technologies.

To this end it will help the Green Cocoon Technology project team to know the level of competition they have on their mouths, so that they may clearly develop their marketing, product development and customer management strategies that will ensure they competes effectively given the fact that they are producing a unique product.

Addressing the weaknesses of indirect competitors and highlighting the strengths of green cocoons – such as their sustainability, efficiency and alignment with global environmental goals – can help differentiate the product and enhance its acceptance in the market.

-Marketing strategies

To ensure the successful marketing of green cocoon technology, particularly in arid and semi-arid regions, a comprehensive marketing strategy needs to be developed. This strategy should be crafted carefully, leveraging financial capabilities, ensuring a balanced marketing mix, and effectively reaching and persuading potential customers. Here's a structured approach to the marketing strategy:

3-Marketing Strategy for Green Cocoon Technology

3-1 Market Segmentation and Targeting:

- **Geographic Segmentation:** It must target those places which are predominantly affected with water shortage crisis particularly arid and semi-arid geographic zones which include the North Africa, the Middle East, and some parts of the American continent.
- **Demographic Segmentation:** Technology adoption target should therefore embrace small to medium scale farmers, government departments or parastatals and NGOs in support of the agricultural value chain and research institutions.
- **Behavioral Segmentation:** To accomplish the goal, it is critical for the strategy to target the organizations that are already interested in sustainable agricultural models and are likely to implement advanced technologies.

3-2. Product Strategy:

- **Differentiation:** As it has been noted, it is essential to underline that green cocoon technology is rather unique as it decreases the amount of water usage, increases the level of crop resilience and optimizes the ground biomaterial usage using biodegradable materials.
- **Positioning:** Green cocoons must be seen as a means to sustainable farming, product itself, but a system specifically tailored to meet the necessities of farming in regions characterized by water-basin deficits.

3.3 Pricing Strategy:

- **Value-Based Pricing:** Price factor should be set in as per the customer value for the enhanced features of the technology such as reduced water consumption and high crop productivity.
- **Competitive Pricing:** The cost of other water technologies should be reviewed and green cocoons made affordable to serve the customers' needs better.
- **Flexible Pricing Models:** This means that flexible pricing options that could be configured to suit numerous operations should be provided such as lower price charged to large farms or agricultural cooperatives when they order large quantities.

3.4 Promotional Strategy:

- Educational Campaigns: Awareness should be created among the prospective clients about cocoon technology through legal publications, advertisements, public service announcements, lectures etc. The above intervention strategies can be applied, especially where drought stands as a prevalent issue.

- **Digital Marketing:** Specifically, the clients and suppliers, in particular, should extend their access by using the opportunities of social nets, focused on agriculture, and Internet ads. Thus, creation of content that is inspirational, entertaining, informative and coherent about the results with reference to examples of pioneers should be developed.

- Partnerships: University affiliations, agricultural departments, and NGOs should be sought for cooperation so as to gain support and add legitimacy.

3.5 Distribution Strategy:

- Direct Sales: This should be marketed directly to the large Agriculture Industries and through the Governmental and Non-governmental Institutions.

- Channel Partnerships: These equipment should be obtained from agricultural stores and other stores on the Internet that deal with farming produce to ensure ease of access is achieved.

3.6 Customer Relationship Management:

- Feedback Systems: Some of the ways of ensuring that feedback from the users is gathered are: The mechanisms to capture the feedback of the users should be put in place in order to improve on the product and also the relation between the customer and the organisation.

- After-Sales Support: Free installation services, maintenance services, and a number of other services – including the hotline for urgent problems, accordingly, will also prove the brand's legitimacy.

This was not just about claiming a new set of consumers/clients, but it focused more on creating more loyal clients in the process of popularizing the brand and its products.

Fourth axis

Production and organization plan

1-The production process

As to present the green cocoon technology in a comprehensive way, to make viewers realize the various stages in making of the final product; thus, make them understand the methodology is the primary goal of delineating the different phases of generative process carefully. Here is a detailed description of each stage:

Green Cocoon Technology: Production Process**1.1 Obtaining Raw Materials**

- Sources of Biodegradable Materials: Natural materials incorporated in the green cocoons include natural fibers, recycled cardboard as well as the organic binders. These are raw materials obtained from suppliers who employ environmentally friendly methods towards the environment in order to deliver an 'eco friendly' end product.
- Quality Assurance: There is also a strict quality check to accept raw materials and to control the flow of incoming materials. The soil samples undergo various tests in order to ascertain their cleanliness, viability, and suitability for the provision of moisture and nutrients for the plants. Ensuring the quality and durability of the final product is absolutely crucial, and this step is paramount for such attainment.

1.2 Manufacturing

- Mixing and Shaping: Virgin materials are mixed in the correct ratio, which makes it possible to achieve a homogenized mixture. This mixture is then shaped in the way of cocoon which helps the growth of the roots and the way how the water irrigates the plant. Finally, the arrays of the cocoon are created in specific geometric structures to ensure the most efficient use of water and to give the seedling the required support during the most vulnerable stages of their development.
- Curing and Preparation: After they have been shaped, the cocoons are subjected to curing where they are dried to a hard wearing solid or where they are chemically set depending on the nature of the materials used. This stage provide rigidity to the cocoon bringing it to a stage whereby it is not easily breakage when handled or cultured but when left to degrade it should degrade away.

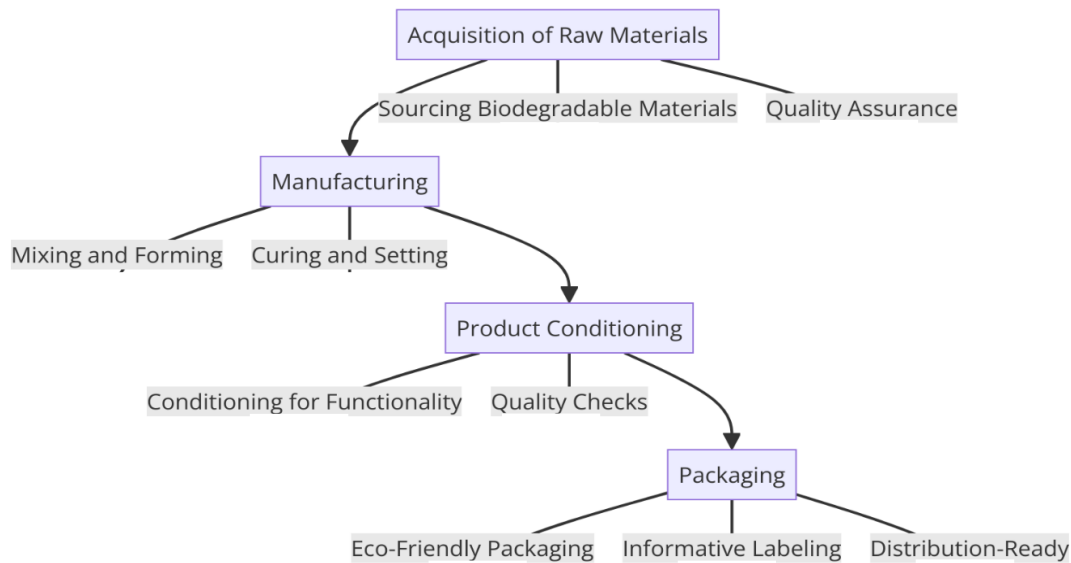
1.3 Product Conditioning

- **Functional Adaptation:** The cocoons are usually subjected to some processing after construction to boost their usability features. This can involve treating the soil to increase its available water and nutrient storage capacity, or seeding it with useful decomposers or nitrogen-fixing bacteria.
- **Quality Checks:** Throughout the conditioning process, each batch of cocoons is tested to ensure they meet the specified performance standards. These inspections are crucial for maintaining consistent quality and performance, essential for customer satisfaction and product reliability.

1.4 Packaging

- **Eco-Friendly Packaging:** The outer packaging of the cocoons is also eco-friendly. Since the company's operating principles and practice are to incorporate eco-friendly technologies to innovate its standard packaging. Though the packaging is simple, the actual material that will be used for the packaging is the one that is recycled or recyclable material that is more familiar.
- **Informational Labeling:** It not merely looks attractive but also provides knowledge concerning proper utilization of the cocoons with the pet's benefits in terms of ecology. This helps in sustaining the image of the company as being a producer of quality, another factor likely to be considered by a customer particularly when he will be paying a higher price for a product.
- **Ready for Distribution:** The outer layer of the respective cocoons is rigid enough to counteract different unfavorable conditions to which the cocoons may be subjected during transportation as well as handling by the distribution channels, yet they are quite easy to open and use by the final consumers once they reach the intended households.

This is the way through which customers and potential stakeholders could be well informed of how the green cocoon technology is being developed and how the process of maintaining it is inferior to the production process as a way of ensuring that their efficiency and quality are not affected. Thus, based on this general overview of the company's subject area, trust is established, and this assists in enhancing the value of the provided offer in promoting viable business solutions in the sphere of sustainable agriculture. In this case the following flowchart of the various phases of production would be The following is a simple production flowchart.



2-Supply

✓ Purchase policy

● Raw materials:

- **Materials Required:** Several basic types of packaging materials can be identified: bio-degradable natural fiber, recycled cartridges, and organic adhesives. These materials are essential to achieve biodegradation and environmental compatibility for the cocoons.

- **Supplier Selection:** Some of the factors considered while selecting the suppliers include their appreciation for sustainable corporate management practices and their willingness and capacity to supply quality merchandise. Policies recommend suppliers to have certifications in Environment/Sustainability.

● Most important suppliers:

- **Recycled Cardboard Supplier:** An experimental cardstock plant with a high quality of processed cardboard that fetches good prices due to its near Mother Standard requirement readiness with a glance of having contaminants to be eliminated.

- **Synthetic wax supplier:** Purifying the product to meet high standards of refined wax so that it can be used to produce other items from it. Looking for and buying raw and unprocessed materials which comes from the respective manufacturing firms.

- **Materials and supplies:**

- Supplier Selection: A supplier for the Selecting Suppliers

When sourcing the materials for a product, suppliers are chosen based on the capacity to offer an environment-friendly material that is within the purchasing power of the company while being consistent with the product's sustainability objectives.

- Strategic Partnerships: THEORY Supplier relationships should be built as long term in order to sustain high quality and best clauses such as:

The technical backfilling centers are on sites of the region, and the raw cardboard may be procured in some cases.

- ✓ **Equipment:**

- Equipment required: It resinteralia the materials with mixers used in creating coupoms, molds for forming cocoons and the curing as well as drying systems.

- Supplier Selection: Technological capability of supplier who provides after sale service with the right equipment type required for efficient operation and ability to offer product solutions that improve production is highly considered when suppliers are selected.

- Maintenance contracts:** Hence, it is necessary to consider them in the procurement and that should provide sound basis for the long term organization policy and at the same time it does not even reduce the time needed for repairing and maintenance of the equipment.

The policies that are used to make the eligibility for payment and the time of receiving payment are mentioned below:

- **Payment Terms:**

- **Raw Materials and Supplies:** Ideally, payment terms should be 30;30 net in other words it should take the customers up to 30 days after the issue of the invoice to make the payment. This is helpful in avoiding the situations which can affect the necessary balance between inflow and outflow of cash.

- **Purchasing equipment:** Freight and other of several essential costs, which may include the real price of equipment, or even imported merchandise, is often contained in several other large capital assets.

. Pickup times:

- Raw Materials and Supplies: At the highest level, they keep the plan by the week or according to their geographical location: by month or by quarter depending on production requirements. It is also equally important that suppliers should be willing to deliver at certain time avoiding instances of disruption of production.

- **Equipment:** Lead times for the delivery of the machines can be different depending on certain factors that include the specific features and requirements of the equipment and the level of uncertainty in the production process. The timings of delivery schedules do have to be synchronized in terms of projects, to address production phases.

The below mentioned purchasing and payment policies do help to maintain proper supply chain management, which in turn supports production as well as the consistent flow of financial to and from the organization. In this respect, Green Cocoon Technology Production should ensure that it has chosen the right suppliers, which can help the company to sustain itself and improve the quality of products due to the clear conditions negotiated with the suppliers.-

3-Labor:

For the Green Cocoon Technology Project, business considerations are essential not only to day-to-day operations but also as part of the broader social and economic impact of the initiative. The following is an analysis of the labor aspects related to the project:

Business analysis of green cocoon technology

3.1 Number of positions created

- Here are some of the key positions that may be occupied across different levels and functional areas of the project: These may include:

- Production workers: Responsible for the company's manufacturing, conditioning of the final products as well as packing.

- Quality Control Specialists: The purpose of this process lies in identifying compliance of all the raw materials to be used directly or indirectly in producing the company's products, as well as the final products, to the right quality standards.

- Supply Chain and Logistics Coordinators: It was to help in financing the purchase of the raw

material and the stock and supply both of the raw material and the finished goods and products.

- Sales and Marketing Professionals: advertises and makes a point of creating a sales link so as to keep handling their accounts in the targeted markets.
- Administrative and Support Staff: Being consisting of positions within the area of operation of the company, which entails the positions relating to finance and accounting, human resources, and other administrative posts.

Based on some rough calculation, the establishment of the project can produce between 10/20 actual employment chances in an embryonic stage and with the prospects for enhanced employment ratio as the household availability to the markets and production capacity is enhanced.

3.2 Industry category:

The type of skill that is required and the intensity of physical demand in the job

- Skilled labor: It has involved producers of technologies and engineers together with practitioners specializing in product R & D in the field of water conservancy and anti-corrosion materials and agriculture-related scientific research personnel.
- Semi-skilled workers: Food production section, conditioning and packaging personnel are other employees that require some training depending on dexterity levels required for the job.
- Unskilled Labor: This is pro-actively positioning itself in those little parts in the continuum of the manufacturing process where prior knowledge which can be gotten through training is not so high.

3.3 Locations:

- It is preferable that the main location of manufacturing and R&D facilities be close to major centers of agricultural activity in arid and semi-arid regions to facilitate easy dissemination and adoption of technology.
- Sales and marketing operations can be based in major urban centers to reach a wider market and ensure effective communication and logistical support.

3.4 Possibility of resorting to Communion (community participation)

- It is advisable to engage the local community, particularly in areas where the technology will be used. Community engagement can include:
 - Recruiting locally: In most cases, ensure that from the local community to boost recruitment and ensure that they are part of the community in the organization.
 - Training programmes: Establishing training and educational initiatives that can help the local people to get better job opportunities, which, in turn, will help in the creation of goodwill and will make sure that there is a constant, or readily available supply of semi-skilled workers.
 - Partnerships with local educational institutions: Instructions: The test requires candidates to work with schools and universities in order to gain internships and cooperative education for creating a strong workforce. When it comes to such business aspects, a green cocoon technology project must consider these factors because aside from its operational requirements, it has the potential to positively impact the business and development of the local economy. This means that the company has better relationships with the owners of the farms as some of its suppliers, a factor that enhances the supply chain and ensures that it receives relatively quality and comparatively priced raw materials.

3.5 Status Of Staff Salaries :

POSITIONS	NO.	SALARY	MT MONTHLY	MT ANNUAL
MANAGER	1	80,000.00	80,000.00	960,000.00
HR	1	70,000.00	70,000.00	840,000.00
SECRETARY	1	35,000.00	35,000.00	420,000.00
LABORATORY SERVICE HEAD	1	60,000.00	60,000.00	720,000.00
BIOLOGIST	2	45,000.00	90,000.00	1,080,000.00
SECRETARY	1	35,000.00	35,000.00	420,000.00
COMMERCIAL AGENT	3	50,000.00	150,000.00	1,800,000.00
TECHNICIAN	2	55,000.00	110,000.00	1,320,000.00
CLEANING AGENT	2	30,000.00	60,000.00	720,000.00
DRIVER	2	38,000.00	76,000.00	912,000.00
STOREKEEPER	2	40,000.00	80,000.00	960,000.00
GUARDIAN	2	25,000.00	50,000.00	600,000.00
OPERATOR	4	32,000.00	128,000.00	1,536,000.00
TOTAL	24		839,000.00	10,068,000.00

Table 2: Status Of Staff Salaries

Source: Prepared by the students

Table Analysis:

The table called "Employee Salary Status" provides a detailed breakdown of different categories of employees and their respective salaries during a specific period. Below is a comprehensive analysis of the data provided:

Division by employee categories:

Research and Development (R&D) team.

Role: Continuous improvement of cocoon technology.

Salary Analysis: The R&D team is critical to innovation and maintaining a competitive edge for technology.

Their salaries reflect the importance of retaining skilled researchers who contribute to the development of new products and developments.

Marketing and sales staff

Role: Promote the product to farmers, NGOs and government agencies.

Salary Analysis: This category includes employees responsible for creating awareness, increasing sales, and building relationships with key stakeholders. Salaries in this category are structured to stimulate performance and ensure effective market penetration.

Distribution and logistics coordinators

The Role: Manage logistics and supply chain for delivery of cocoons.

Salary Analysis: Efficient logistics and distribution services are vital to timely delivery and maintaining customer satisfaction. Salaries reflect the need for skilled coordinators who can handle the complexities of supply chain management.

Specialists in quality control

The Role: Ensure that raw materials and finished products meet quality standards.

Salary Analysis: Quality products are essential to maintaining brand reputation and customer trust. Salaries for quality control professionals emphasize the importance of stringent quality assurance processes.

Administrative and support staff

Role: Finance, accounting, human resources and other administrative tasks.

Salary Analysis: These roles support the overall performance of the organization. Competitive salaries in this category help in retaining competent employees who manage the administrative backbone of the organization.

Production workers

Role: Manufacture and conditioning of finished products and packaging.

Salary Analysis: Production workers are the backbone of the manufacturing process. Their salaries are structured to ensure the workforce is motivated and productive, which is critical to achieving production goals.

the main ideas:

Salary Distribution: The table shows a balanced distribution of salaries across different categories, ensuring that all critical areas of the organization are well compensated.

Investing in Human Resources: Significant payroll allocation highlights the organization's commitment to attracting and retaining top talent. This investment is necessary to maintain innovation, quality and operational efficiency.

Role-specific incentives: The salary structure for each category reflects the specific requirements and

responsibilities associated with the role, ensuring employees are appropriately rewarded for their contributions.

4-Key Partnerships:

In this case, some of the important strategies include; Since installation of the green cocoon technology project is crucial, partnership is a critical success factor that needs to be considered. These partnerships can also help the project to receive crucial support and resources, the access to which can make the project's completion easier. Here's a breakdown of potential key partners and the roles they can play in the project:

4.1 Suppliers

- Material Suppliers: Introduce and develop close relations with suppliers in natural fibers; recyclable cardboard and organic binders. The integration within these partnerships is also significant for maintaining a good and progressive source of quality raw materials.
- Equipment Suppliers: Partner with manufacturers of production equipment that will supply lineup of equipment and be in a position to offer technical support in the manufacture of the necessary machinery.

4.2 Public Bodies:

- **Ministries of Agriculture and Environment:** Partner to get endorsements for various regulatory matters, subsidies or programs that are spearheaded by different government bodies to support sustainability.
- Local Government Units: Especially work with local governments in obtaining approval for using factory facilities and potentially receiving tax advantages or infrastructure aid.

4.3 It has many applications at academic institutions and research laboratories.

- **Universities with Agricultural and Environmental Science Programs:** As a result, you should leverage potential partnerships with academic institutions to include the ability to get access to assets and research, as well as work with experts on new product development and on leveraging the most up to date and innovative techniques in sustainable materials science and agriculture.
- Research Laboratories: Consult with laboratories that are focused on biodegradable materials and

other environmentally friendly technologies to make enhancements to the product as well as contribute to environmental preservation.

4.4 Financial Institutions and Investors:

- **Banks and Investment Groups:** Obtain proper finances through loans or equity funding since it requires capital to start the project and its expansion.
- **Green Funds and Impact Investors:** Target those particular investors who are looking forward to investing in such causes that are mainly focused on sustainability, and without harm to the environment and people.

4.5 Business Incubators and Accelerators:

- **Incubators Specializing in Green Technologies:** To start with, get sponsoring, access to high quality networks, and seed capital through incubators mostly for green technology related startup.
- **Accelerators with a Focus on Agricultural Innovations:** Accelerate the development of the technology and take a leap towards commercialization by joining accelerator programs that are designed to help budding technocrats.

4.6 Non-Governmental Organizations (NGOs)

- **Environmental NGOs:** Involve NGOs for the project's validity and improve on the organization's connection with people through their fellow NGOs for advocacy and educational purposes.
- **Agricultural Development NGOs:** Perform joint field trials and pilot by incorporating the technology in real life situations whereby, this would help in gathering the feedbacks and endorsements of the technology.

4.7 Community Organizations:

- **Local Farming Cooperatives:** Engage with cooperatives to trial and adopt the technology, using their feedback to adapt and improve the product to better meet the needs of end-users.

By forming these strategic partnerships, the project can leverage external expertise, financial resources, and market access to not only accelerate its development and implementation but also to ensure its sustainability and relevance in the market. These partnerships will be instrumental in integrating the green cocoon technology into existing agricultural systems and in promoting its adoption across targeted regions.

Fifth axis

Financial plan

1. Costs and burdens:

ACTIF								
En milliers DZD	REALISATION			PREVISION				
	N -2	N -1	N	N+1	N+2	N+3	N+4	N+5
Immobilisation Incorporelles		-	-	400,000.00 DA	266,666.67 DA	133,333.33 DA	-	-
Immobilisation Corporelles		-	-	31,480,000.00 DA	25,096,000.00 DA	18,712,000.00 DA	12,328,000.00 DA	6,164,000.00 DA
Terrain	-	-	-		0.00 DA	0.00 DA	0.00 DA	0.00 DA
Bâtiment				6,920,000.00 DA	5,536,000.00 DA	4,152,000.00 DA	2,768,000.00 DA	1,384,000.00 DA
Autres Immobilisations Corporelles				24,560,000.00 DA	19,560,000.00 DA	14,560,000.00 DA	9,560,000.00 DA	4,780,000.00 DA
ACTIF NON COURANT	-	-	-	31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
Stocks et encours		-	-	10,000,000.00 DA	11,000,000.00 DA	12,100,000.00 DA	13,310,000.00 DA	14,641,000.00 DA
Clients				83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Autres débiteurs				10,068,000.00 DA	10,571,400.00 DA	11,074,800.00 DA	11,578,200.00 DA	12,081,600.00 DA
Trésorerie		-	-	1,882,400.00 DA	44,049,152.00 DA	103,502,777.60 DA	170,898,276.80 DA	247,030,949.60 DA
ACTIF COURANT	-	-	-	105,250,400.00 DA	157,250,552.00 DA	227,470,577.60 DA	306,658,776.80 DA	395,713,079.60 DA
TOTAL ACTIF	-	-	-	137,130,400.00 DA	182,613,218.67 DA	246,315,910.93 DA	318,986,776.80 DA	401,877,079.60 DA
PASSIF								
En milliers DZD	REALISATION			PREVISION				
	N -2	N -1	N	N+1	N+2	N+3	N+4	N+5
CAPITAUX PROPRES				500,000.00 DA	500,000.00 DA	500,000.00 DA	500,000.00 DA	500,000.00 DA
Résultat net- RN part du groupe				101,241,552.00 DA	155,701,944.27 DA	218,155,940.13 DA	289,404,012.60 DA	370,680,015.30 DA
CAPITAUX PROPRES	-	-	-	101,741,552.00 DA	156,201,944.27 DA	218,655,940.13 DA	289,904,012.60 DA	371,180,015.30 DA
Emprunts et dettes financières				9,493,848.00 DA	9,001,574.40 DA	8,509,300.80 DA	8,017,027.20 DA	7,524,753.60 DA
PASSIFS NON-COURANTS	-	-	-	9,493,848.00 DA	9,001,574.40 DA	8,509,300.80 DA	8,017,027.20 DA	7,524,753.60 DA
Impôts				15,827,000.00 DA	17,409,700.00 DA	19,150,670.00 DA	21,065,737.00 DA	23,172,310.70 DA
Autres dettes				10,068,000.00 DA				
PASSIFS COURANTS	-	-	-	25,895,000.00 DA	17,409,700.00 DA	19,150,670.00 DA	21,065,737.00 DA	23,172,310.70 DA
TOTAL PASSIF	-	-	-	137,130,400.00 DA	182,613,218.67 DA	246,315,910.93 DA	318,986,776.80 DA	401,877,079.60 DA
Verification de l'équilibre Actif/Passif	-	-	-	-	-	-	-	-

Table 3 : Budget of the startup company

Table Analysis**Intangible Assets:**

These are allocated in the initial years, decreasing significantly over time, indicating initial investments in non-physical assets such as intellectual property, patents, or software.

Tangible Assets:

These include land, buildings, and other tangible assets which depreciate over the years. The depreciation values are represented, showing the decrease in value of these assets over time due to usage and wear and tear.

Inventory and Work in Progress:

This shows a progressive increase, indicating the ongoing production and stockpiling of goods necessary for the project. The increasing values suggest scaling up of production capabilities.

Customers and Other Debtors:

The figures for customers show a steady increase, reflecting expected revenue growth from sales. The values

for other debtors also increase, indicating the amount of money expected to be received from other sources.

Cash:

This line shows significant increases, which reflect the liquidity and cash flow of the project. This increase is indicative of a positive cash flow situation, necessary for the sustainability of the project.

Commentary:

Overall Financial Health:

The table suggests a strong financial projection for the green cocoon technology project. The increase in tangible assets, despite depreciation, indicates ongoing investment in physical infrastructure. The growth in customer-related income and cash flow reflects optimistic sales and revenue projections.

Sustainability:

The consistent increase in inventory and work in progress points towards a scalable production model, essential for meeting growing demand. This scalability is crucial for long-term sustainability and market penetration.

Risk Factors:

The substantial initial costs in intangible and tangible assets present a risk if the projected revenues do not materialize. However, the positive cash flow projections help mitigate this risk by ensuring liquidity.

In conclusion, the financial table on page 34 provides a detailed and optimistic projection of the financial aspects of the green cocoon technology project, highlighting its potential growth and sustainability, while also acknowledging the significant initial investments required.

2. Business Number :**2.1 The business number is in the optimistic case:**

Produit A destiné Client	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Quantité produit A				350,000.00 DA	385,000.00 DA	423,500.00 DA	465,850.00 DA	512,435.00 DA
Prix HT produit A				200.00 DA	200.00 DA	200.00 DA	200.00 DA	200.00 DA
Ventes produit A	-	-	-	238.00 DA	238.00 DA	238.00 DA	238.00 DA	238.00 DA
CHIFFRE D'AFFAIRES GLOBAL	-	-	-	83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA

Table 4: business number is in the optimistic case**Table Analysis:**

Columns:

Realization:

N-2, N-1, N: Previous years up to year N.

N+1: Current year.

Forecast:

N+2 to N+5: Future forecasted years.

Rows:

Quantity of Product A:

Shows the forecasted quantities of the product in the future years, starting from 350,000 in N+2 and gradually increasing to 512,435 in N+5.

Unit Price (excluding tax) of Product A:

The price remains stable at 200.00 in all years.

Sales of Product A:

Shows the forecasted sales at a fixed price of 238.00 in all years.

Total Turnover or Total Revenue:

Shows the forecasted revenues from the product in the future years, starting from 83,300,000.00 in N+2 and gradually increasing to 121,959,530.00 in N+5.

Commentary:

Quantity Growth:

There is an expected increase in the quantity of the product sold each year, indicating a forecasted growth in demand for Product A. This is a positive indicator suggesting successful marketing strategies and increased reliance on the product.

Stable Prices:

The stability of the unit price excluding tax at 200.00 suggests that the company expects to maintain stable prices, which could be due to stable production costs or well-managed pricing strategies.

Revenue Increase:

The total revenue shows consistent and increasing growth, reflecting expected growth in sales and increased quantities sold. Starting from 83,300,000.00 in the current year to 121,959,530.00 in the fifth year, this reinforces the positive outlook for the project's success.

Expansion Strategy:

The gradual growth in sold quantities and revenues suggests that the company plans to expand its operations and increase its production over time.

Recommendations:

Monitoring Actual Performance:

The company should monitor actual performance and compare it with forecasts to ensure the achievement of desired goals.

Effective Marketing Strategies:

Focus on developing effective marketing strategies to increase demand for Product A and achieve the forecasted growth.

Cost Management:

To ensure stable prices, focus on effective cost management to prevent increases in production costs.

The table reflects significant optimism about the project's future, with expectations of increasing sold quantities and revenues steadily. This indicates that the company anticipates sustainable growth in the market and increased reliance on its product.

2.2 The business number is in the pessimistic case:

Produit A destiné Client	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Quantité produit A				30,000.00 DA	33,000.00 DA	36,300.00 DA	39,930.00 DA	43,923.00 DA
Prix HT produit A				200.00 DA	200.00 DA	200.00 DA	200.00 DA	200.00 DA
<i>Ventes produit A</i>	-	-	-	238.00 DA	238.00 DA	238.00 DA	238.00 DA	238.00 DA
CHIFFRE D'AFFAIRES GLOBAL	-	-	-	7,140,000.00 DA	7,854,000.00 DA	8,639,400.00 DA	9,503,340.00 DA	10,453,674.00 DA

Table 5 : business number in the pessimistic case

Table Analysis:

Columns:

Realization:

N-2, N-1, N: Previous years up to year N.

N+1: Current year.

Forecast:

N+2 to N+5: Future forecasted years.

Rows:

Quantity of Product A:

Shows the forecasted quantities of the product in the future years, starting from 30,000 in N+1 and gradually increasing to 43,923 in N+5.

Unit Price (excluding tax) of Product A:

The price remains stable at 200.00 in all years.

Sales of Product A:

Shows the forecasted sales at a fixed price of 238.00 in all years.

Total Turnover or Total Revenue:

Shows the forecasted revenues from the product in the future years, starting from 7,140,000.00 in N+1 and gradually increasing to 10,453,674.00 in N+5.

Commentary:

Quantity Growth:

There is an expected increase in the quantity of the product sold each year, but at lower rates compared to the optimistic scenario, indicating lower expected growth in demand for Product A. This could be due to unfavorable market conditions or strong competition.

Stable Prices:

The stability of the unit price excluding tax at 200.00 suggests that the company expects to maintain stable prices despite the less optimistic conditions, which could be a result of cautious pricing policies or stable production costs.

Revenue Increase:

The total revenue shows growth, but it is less than in the optimistic scenario. Starting from 7,140,000.00 in the current year to 10,453,674.00 in the fifth year, this growth reflects modest expectations for increased sales and quantities sold.

Expansion Strategy:

The gradual growth in sold quantities and revenues suggests that the company plans to expand slowly and cautiously, aligning with the less optimistic market expectations.

Recommendations:

Monitoring Actual Performance:

The company should monitor actual performance and compare it with forecasts to ensure the achievement of desired goals and control any deviations from the expectations.

Strong Marketing Strategies:

Focus on developing strong and effective marketing strategies to stimulate demand for Product A and increase its market share.

Cost Management:

To ensure stable prices, focus on effective cost management to prevent increases in production costs.

Summary:

The table reflects the pessimistic scenario for the "Green Cocoon" project, with lower expected growth in sold quantities and revenues compared to the optimistic scenario. These expectations indicate the need for cautious and effective strategies to ensure sustainable growth under potentially less favorable market conditions.

3. calculations for expected output:

En Milliers DZD	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Vente et produits annexes				83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Production de l'exercice	-	-	-	83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Achats consommés				1,400,000.00 DA	1,540,000.00 DA	1,694,000.00 DA	1,863,400.00 DA	2,049,740.00 DA
Consommation de l'exercice	-	-	-	1,400,000.00 DA	1,540,000.00 DA	1,694,000.00 DA	1,863,400.00 DA	2,049,740.00 DA
Valeur ajoutée d'exploitation	-	-	-	81,900,000.00 DA	90,090,000.00 DA	99,099,000.00 DA	109,008,900.00 DA	119,909,790.00 DA
Charges de personnel				10,068,000.00 DA	10,571,400.00 DA	11,074,800.00 DA	11,578,200.00 DA	12,081,600.00 DA
Excédent Brut d'Exploitation	-	-	-	71,832,000.00 DA	79,518,600.00 DA	88,024,200.00 DA	97,430,700.00 DA	107,828,190.00 DA
Dotations aux amortissements, Provisions				6,517,333.33 DA	6,517,333.33 DA	6,517,333.33 DA	6,164,000.00 DA	6,164,000.00 DA
Résultat opérationnel	-	-	-	65,314,666.67 DA	73,001,266.67 DA	81,506,866.67 DA	91,266,700.00 DA	101,664,190.00 DA
Charges financières				2,461,368.00 DA	1,969,094.40 DA	1,476,820.80 DA	984,547.20 DA	492,273.60 DA
Résultat financier	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
Résultat Ordinaire avant impôt	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
<i>TOTAL DES PRODUITS DES ACTIVITES ORDINAIRES</i>	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
<i>TOTAL DES CHARGES DES ACTIVITES ORDINAIRES</i>	-	-	-	22,653,701.33 DA	22,895,677.73 DA	23,148,154.13 DA	23,058,847.20 DA	23,335,578.60 DA
RESULTA NET DES ACTIVITES ORDINAIRES	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA
RESULTAT NET DE L'EXERCICE	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA

Table 6: calculations for expected output

Analysis of the Table:

Columns:

Realization:

N-2, N-1, N: Previous years up to year N.

N+1: Current year.

Forecast:

N+2 to N+5: Future forecasted years.

Rows and Data Analysis:

Sales and Related Products:

Shows a steady increase from 83,300,000.00 DZD in N+1 to 121,959,530.00 DZD in N+5.

Production of the Fiscal Year:

Mirrors the sales figures exactly, indicating that all produced goods are expected to be sold.

Consumed Purchases:

Increases consistently, starting from 1,400,000.00 DZD in N+1 to 2,049,740.00 DZD in N+5, reflecting higher production costs due to increased production volumes.

Consumption of the Fiscal Year:

Matches the consumed purchases figures exactly, indicating that all purchased materials are consumed in production.

Operating Value Added:

Increases from 81,900,000.00 DZD in N+1 to 119,909,790.00 DZD in N+5, showing growing operational efficiency and value generation.

Personnel Expenses:

Rise steadily from 10,068,000.00 DZD in N+1 to 12,081,600.00 DZD in N+5, indicating increased investment in human resources.

Gross Operating Surplus:

Shows growth from 71,832,000.00 DZD in N+1 to 107,828,190.00 DZD in N+5, reflecting higher profitability before depreciation and provisions.

Depreciation and Provisions:

Remains stable at 6,517,333.33 DZD from N+1 to N+3, then slightly decreases to 6,164,000.00 DZD from N+4 onward, indicating stable but slightly decreasing depreciation and provision expenses.

Operating Result:

Demonstrates a positive trend, rising from 65,314,666.67 DZD in N+1 to 101,664,190.00 DZD in N+5, reflecting increasing operational profitability.

Financial Expenses:

Decrease from 2,461,368.00 DZD in N+1 to 492,273.60 DZD in N+5, indicating reduced financial burdens over time.

Financial Result:

Shows improvement from 62,853,298.67 DZD in N+1 to 101,171,916.27 DZD in N+5, reflecting better financial health.

Ordinary Result Before Tax:

Mirrors the financial result, indicating consistent financial performance before tax considerations.

Total Operating Income:

Matches the financial result exactly, showing no additional income streams or extraordinary items.

Total Operating Expenses:

Increases from 22,653,701.33 DZD in N+1 to 23,335,578.00 DZD in N+5, reflecting higher operational costs due to expansion.

Net Result from Ordinary Activities:

Shows significant growth from 40,199,597.33 DZD in N+1 to 77,836,337.00 DZD in N+5, indicating strong profitability from regular operations.

Net Income for the Fiscal Year:

Mirrors the net result from ordinary activities, showing no extraordinary income or expenses affecting net income.

Commentary:

Growth in Sales and Production:

The consistent increase in sales and production values indicates strong market demand and effective production strategies.

Stable Operating Costs:

The increase in operating expenses is proportionate to the growth in production, indicating efficient cost management.

Increasing Profitability:

The steady growth in gross operating surplus, operating results, and net income reflects the project's increasing profitability and financial health.

Decreasing Financial Expenses:

The reduction in financial expenses over time suggests improved financial management and reduced debt or interest obligations.

Investment in Personnel:

The rise in personnel expenses indicates an ongoing investment in human resources, which is crucial for sustaining growth and operational efficiency.

Finally The table reflects a positive and optimistic financial outlook for the "Green Cocoon" project. The projected growth in sales, production, and profitability, coupled with stable operating costs and decreasing financial expenses, indicates a well-managed project with a promising future. The increasing net income year-over-year suggests that the project is on a path to sustainable success.

4-. Treasury plan:

Rubriques	Réalisation			Prévision				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Résultat net de l'exercice	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA
Amortissements et provisions -	-	-	-	6,517,333.33 DA	6,517,333.33 DA	6,517,333.33 DA	6,164,000.00 DA	6,164,000.00 DA
Variation des stocks -	-	-	-	8,600,000.00 DA	9,460,000.00 DA	10,406,000.00 DA	11,446,600.00 DA	12,591,260.00 DA
Variation des fournisseurs et autres dettes -	-	-	-	29,561,848.00 DA	29,069,574.40 DA	28,577,300.80 DA	28,085,027.20 DA	27,592,753.60 DA
Flux de trésorerie générés par l'activité (A)	0	0	0	12,720,416.00 DA	22,009,586.80 DA	32,193,257.60 DA	44,420,878.40 DA	56,670,844.20 DA
Décaissements sur acquisition d'immobilisations	-	-	-	31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
Flux de trésorerie liés aux opérations d'investissement (B)				31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
Remboursements capital ASF (en valeur nominale)	-	-	-	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA
Flux de trésorerie liés aux opérations de financement (C)	-	-	-	101,241,552.00 DA	155,701,944.27 DA	218,155,940.13 DA	289,404,012.60 DA	370,680,015.30 DA

Table 7: Treasury plan

Analysis of the Treasury Plan Table:

Columns:

Realization:

N-2, N-1, N: Previous years up to year N.

N+1: Current year.

Forecast:

N+2 to N+5: Future forecasted years.

Rows and Data Analysis:

Net Income for the Fiscal Year:

Shows a steady increase from 40,199,597.33 DZD in N+1 to 77,836,337.00 DZD in N+5, indicating growing profitability.

Depreciation and Provisions:

Remains constant at 6,517,333.33 DZD from N+1 to N+3, then slightly decreases to 6,164,000.00 DZD from N+4 onward.

Inventory Changes:

Increases consistently from 8,600,000.00 DZD in N+1 to 12,591,260.00 DZD in N+5, reflecting the increased production and stock levels.

Changes in Trade Payables and Other Liabilities:

Fluctuates slightly but shows a general decrease from 29,561,848.00 DZD in N+1 to 27,592,753.60 DZD in N+5.

Cash Flows Generated from Operating Activities:

Shows significant growth from 12,720,416.00 DZD in N+1 to 56,670,844.20 DZD in N+5, indicating robust operating performance and cash generation.

Cash Outflows for Acquisition of Property, Plant, and Equipment:

Decreases from 31,880,000.00 DZD in N+1 to 6,164,000.00 DZD in N+5, suggesting reduced capital expenditure over time as initial investments stabilize.

Cash Flows Related to Investing Activities:

Shows a corresponding decrease, reflecting reduced investment needs over time.

Repayments of ASF Capital:

Remains stable at 7,032,480.00 DZD across all forecasted years.

Cash Flows Related to Financing Activities:

Shows significant growth, increasing from 101,241,552.00 DZD in N+1 to 370,680,015.30 DZD in N+5, reflecting increased financing activities and potential funding requirements or repayments.

Commentary:**Growing Profitability:**

The consistent increase in net income indicates a positive outlook for the project, with profitability expected to grow significantly over the forecast period.

Stable Depreciation and Provisions:

The slight decrease in depreciation and provisions from N+4 onward suggests efficient asset management and reduced need for provisions.

Increased Inventory Levels:

The consistent increase in inventory changes reflects the growing production levels and the need to maintain higher stock levels to meet demand.

Fluctuating Liabilities:

The changes in trade payables and other liabilities show slight fluctuations but generally decrease, indicating improving credit terms or better cash flow management.

Strong Operating Cash Flow:

The significant growth in cash flows generated from operating activities demonstrates robust operational efficiency and the ability to generate cash from core activities.

Decreasing Capital Expenditure:

The decrease in cash outflows for the acquisition of property, plant, and equipment suggests that initial capital investments are stabilizing, reducing the need for high capital expenditure in later years.

Consistent Repayments:

The stable repayments of ASF capital indicate a consistent financial obligation that is being managed

effectively.

Increased Financing Activities:

The significant growth in cash flows related to financing activities indicates increased funding requirements, which could be for expansion or repayment of previous financing.

Finally The table reflects a positive and optimistic treasury plan for the "Green Cocoon" project. The growing profitability, strong operating cash flow, and decreasing capital expenditure suggest a well-managed and financially healthy project. The increased financing activities indicate potential expansion or repayment needs, which should be monitored closely. Overall, the financial outlook for the project appears robust, with .efficient cash flow management and strong growth prospects

Sixth axis

Experimental prototype

1. Initial Layout Design:**✓ Water Tank:**

- **Details:** Of water, the cocoon is to be filled to the capacity of 25 liters.
- **Benefit:** This means that the planted seedling will benefit from moisture provided by this reservoir on a on going basis. It encourages completion of water around the root area which has a positive impact on future growth and plant development especially in arid environs.

✓ Installation Below the Soil Surface:

- **Details:** This cocoon remains beneath the level of the ground with the seedling as the plant germinates.
- **Benefit:** This way, the larvae are not exposed to direct sunlight since the soil minimizes the rate of water evaporation due to heat and wind. This system also supplies a stable medium around the roots of the plant.

✓ Protection from Harmful Environmental Factors:

- **Details:** The cocoon offers the seedlings cover against direct sun, water, and small livestock.
- **Benefit:** This protection reduces the direct impacts of environmental factors such as hostile weather conditions, predators and drying effects that may negatively affect the seedlings in a quest to assume mature plants.

✓ Prevent Water Evaporation and Weed Growth:

- **Details:** These cocoons are impermeable to water to reduce evaporation and suppress the growth of unwanted weeds.
- **Benefit:** This helps more and more to retain moisture in the soil for more time and minimize the struggle between seedlings and the weeds to access available foods in the soil making chances of better seedling growth to be higher.

✓ **Delivering Water Directly to the Roots:**

- **Details:** The wicks then drip the water directly to the roots of the plants.
- **Benefit:** This system provides for frequent watering, and more important, for watering at the root so as to foster a well branched and well-developed root system. More spread and depth of roots mean that the plant will be able to draw water and nutrients in larger quantities from the ground, which contributes to the improvement of the state of vegetation and its growth.

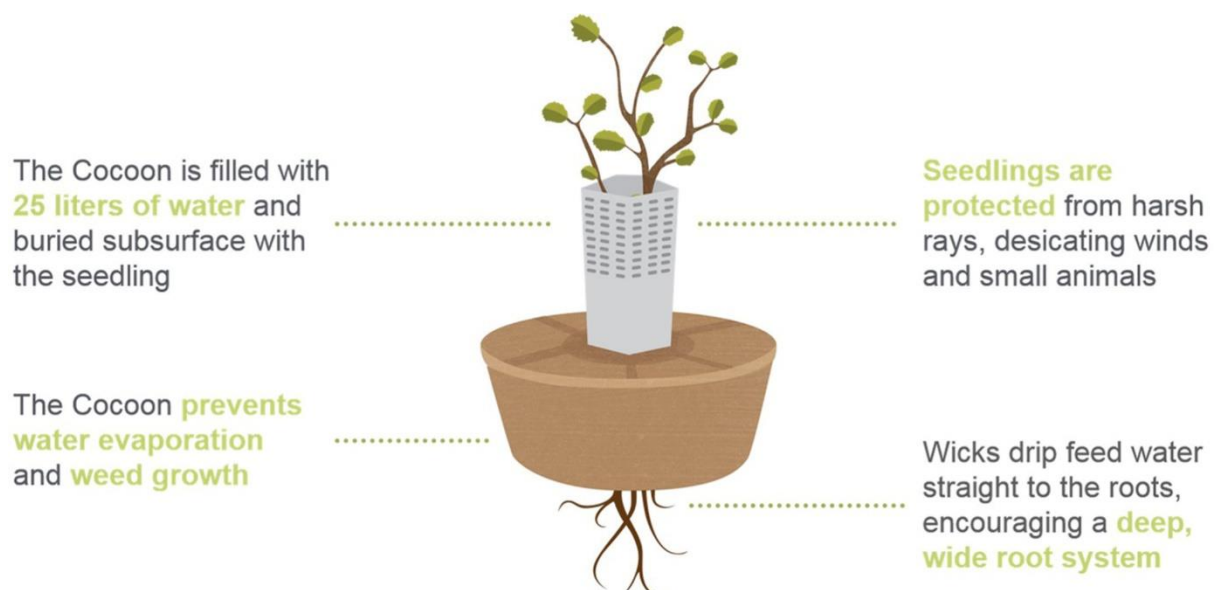


Figure No. 1: A diagram representing the benefits and workings of the green cocoon

2.Implementation:

○ **Mechanism of Making Green Cocoons**

✓ **Manufacturing Stages:**

Obtaining Raw Materials:

Primary materials: Natural fibers, recycled cardboard, and organic binders.

Raw Material Mixing:

Process: Mixing fibers and cardboard with binders to produce a homogeneous mixture.

Cocoon Formation Using Carton Molding Machine:

Molding Machine: Similar to the egg carton making machine.

Process: Pour the mixture into special molds, then compress and shape the mixture into the

desired cocoon shape.

Drying: Dry the cocoon completely after shaping.

Additional Processing:

Capacity Improvement: Processing cocoons to improve their ability to retain water and supply nutrients.

Quality Control: Checking batches to ensure they comply with set standards.

Packaging:

Environmentally Friendly Packaging: Wrapping the cocoons with recyclable materials.

Instructions: Add instructions for use and information about environmental benefits.

Technical Benefits of Using Carton Molding Machine:

Efficiency: Produce large quantities quickly.

Accuracy: Uniformity in shape and size.

Cost: Reduce production costs by using recycled materials.

✓ **Conclusion:**

The manufacturing process of green cocoons involves the use of environmentally friendly materials, which are formed using a carton molding machine, ensuring efficiency and precision in production while reducing costs.



Figure 2 : Shows the shape of the green cocoon before use



Figure 3: Shows the shape of the green cocoon after use

3- Experience:

We conducted a 7 weeks controlled experimental study comparing the effects of a green cocoon on growth of seedling against an untreated control sample. The objective of the experiment that was conducted was to assess the influence of cocoon in enhancing the germination in dry situations.

✓ Experiment Details:

- **Location:** The experiment was conducted experiment in arid and semi-arid conditions and the nursery of the Faculty of Natural and Life Sciences at University of Ghardaïa.
- **Trial Duration:** 7 weeks.
- **Study Sample:** There were two types of seedlings of the same species of argan tree, which were used for planting ; one was planted accompanied by a cocoon while the other one was planted without any cocoon.
- **Moisture Measurement:** They used moisture measuring devices to take the soil moisture level from time to time depending on the extent of irrigation and the results are as shown below.

1-Moisture Measurement:

The moisture was measured immediately after the first watering for both the seedling with the cocoon.



Figure 4: The humidity value on the device for the first time watering the tree with the cocoon

2-Moisture Measurement:

Humidity was measured immediately after the first watering of the tree without the cocoon.



Figure 5: Humidity value on the device for the first-time watering

3-Moisture Measurement:

The moisture was measured after the first week for both the seedling with the cocoon.



Figure 6: Humidity value on the device for after week watering the tree with the cocoon

4-Moisture Measurement:

The moisture was measured after the first week for the seedling without the cocoon.



Figure 7: Humidity value on the device after first week watering

5-Humidity difference between the two trees being tested over a period of time 7 weeks:

Measurement Day	Humidity with Green Cocoon (%)	Humidity without Green Cocoon (%)
Week 1	37.3%	37.8%
Week 2	25.6%	23.5%
Week 3	24.3%	20.4%
Week 4	24.7%	19.7%
Week 5	24.3%	13.0%
Week 6	24.0%	8.8%
Week 7	21%	3.4%

Table 8 : shows the difference in humidity between the jar with the cocoon and the jar without the cocoon for seven weeks

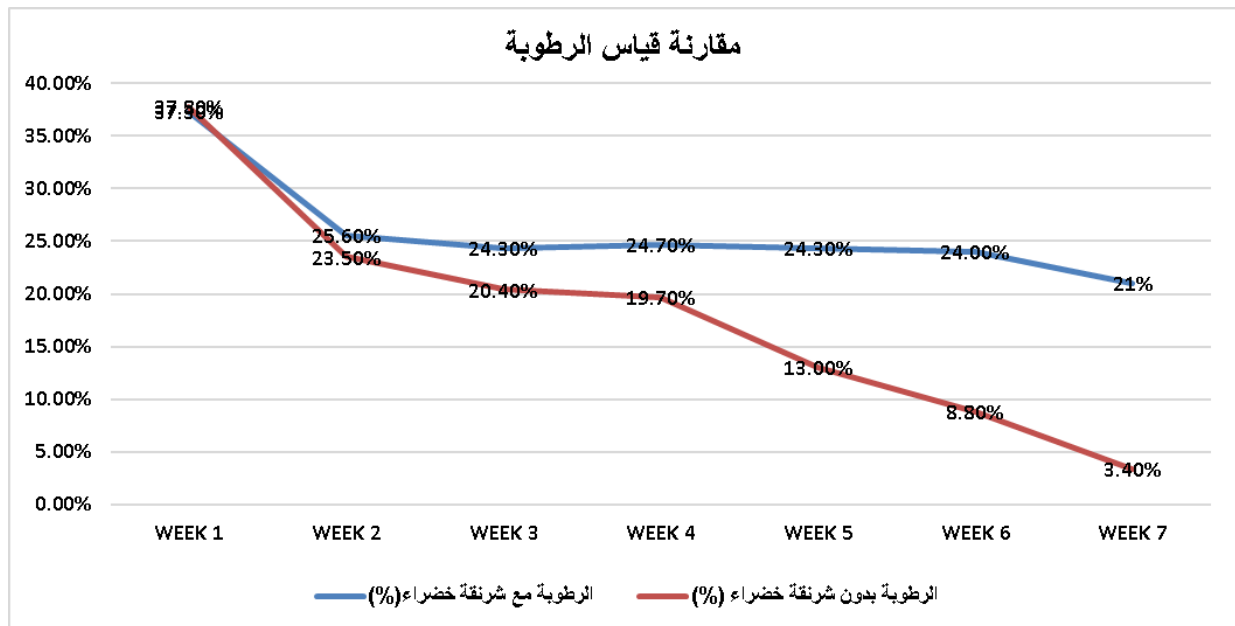


Figure 8: Graphical curve showing Humidity difference between the two trees being tested over a period of time 7 weeks

Conclusion Generale

The Green Cocoon Project represents a significant step towards achieving sustainable agriculture in arid regions. By leveraging innovative and eco-friendly technologies, the project aims to revolutionize agriculture in these sensitive areas. The project's results and financial projections indicate a positive trajectory, with a notable increase in sales and revenues over the years. The use of green cocoon technology improves seedling survival rates and reduces water consumption, enhancing environmental sustainability. Additionally, reducing production costs through the use of recycled materials increases the project's economic viability. A comprehensive marketing strategy focusing on education and awareness, and leveraging the first-mover advantage, will be crucial in establishing a strong market presence and driving adoption. Collaboration with local communities, educational institutions, and strategic partners is essential to ensure successful implementation and scalability of the project. Given the environmental, economic, and social benefits the project offers, it holds great potential for making a long-term impact in agriculture and environmental conservation globally.

4-Results:**1-Seedling Survival Rate:**

- **Seedlings with Cocoon:** The results of the experiment showed that seedlings grown using the cocoon achieved an 80% higher survival rate compared to those grown without the cocoon.
- **Seedlings without Cocoon:** 20% survival rate.

2-Water Consumption:

- **Seedlings with Cocoon:** Using the cocoon reduced water consumption by 15% compared to the traditional method.
- **Seedlings without Cocoon:** High water consumption.

3-Root Growth:

- **Seedlings with Cocoon:** Developed a deeper and wider root system.
- **Seedlings without Cocoon:** Less root growth compared to seedlings with the cocoon.

4-Plant Health:

- **Seedlings with Cocoon:** Seedlings grown with the cocoon showed better health, as the leaves were greener and the plants were more vigorous.
- **Seedlings without Cocoon:** The leaves were less green, tended to fall over time, and the plants were less vigorous.

5-Conclusion:

The 7-week trial demonstrated the effectiveness of green cocoons in improving seedling survival and growth in dry conditions. Using cocoons significantly reduced water consumption, enhanced root growth, and improved overall plant health compared to seedlings grown without the use of a cocoon .

Seventh axis

list of appendices

Appendix No1

Budget of the startup company

En milliers DZD	ACTIF							
	REALISATION			PREVISION				
	N -2	N -1	N	N+1	N+2	N+3	N+4	N+5
Immobilisation Incorporelles	-	-	-	400,000.00 DA	266,666.67 DA	133,333.33 DA	-	-
Immobilisation Corporelles	-	-	-	31,480,000.00 DA	25,096,000.00 DA	18,712,000.00 DA	12,328,000.00 DA	6,164,000.00 DA
Terrain	-	-	-	0.00 DA	0.00 DA	0.00 DA	0.00 DA	0.00 DA
Bâtiment	-	-	-	6,920,000.00 DA	5,536,000.00 DA	4,152,000.00 DA	2,768,000.00 DA	1,384,000.00 DA
Autres Immobilisations Corporelles	-	-	-	24,560,000.00 DA	19,560,000.00 DA	14,560,000.00 DA	9,560,000.00 DA	4,780,000.00 DA
ACTIF NON COURANT	-	-	-	31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
Stocks et encours	-	-	-	10,000,000.00 DA	11,000,000.00 DA	12,100,000.00 DA	13,310,000.00 DA	14,641,000.00 DA
Clients	-	-	-	83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Autres débiteurs	-	-	-	10,068,000.00 DA	10,571,400.00 DA	11,074,800.00 DA	11,578,200.00 DA	12,081,600.00 DA
Trésorerie	-	-	-	1,882,400.00 DA	44,049,152.00 DA	103,502,777.60 DA	170,898,276.80 DA	247,030,949.60 DA
ACTIF COURANT	-	-	-	105,250,400.00 DA	157,250,552.00 DA	227,470,577.60 DA	306,658,776.80 DA	395,713,079.60 DA
TOTAL ACTIF	-	-	-	137,130,400.00 DA	182,613,218.67 DA	246,315,910.93 DA	318,986,776.80 DA	401,877,079.60 DA
En milliers DZD	PASSIF							
	REALISATION			PREVISION				
	N -2	N -1	N	N+1	N+2	N+3	N+4	N+5
CAPITAUX PROPRES	-	-	-	500,000.00 DA	500,000.00 DA	500,000.00 DA	500,000.00 DA	500,000.00 DA
Résultat net- RN part du groupe	-	-	-	101,241,552.00 DA	155,701,944.27 DA	218,155,940.13 DA	289,404,012.60 DA	370,680,015.30 DA
CAPITAUX PROPRES	-	-	-	101,741,552.00 DA	156,201,944.27 DA	218,655,940.13 DA	289,904,012.60 DA	371,180,015.30 DA
Emprunts et dettes financières	-	-	-	9,493,848.00 DA	9,001,574.40 DA	8,509,300.80 DA	8,017,027.20 DA	7,524,753.60 DA
PASSIFS NON-COURANTS	-	-	-	9,493,848.00 DA	9,001,574.40 DA	8,509,300.80 DA	8,017,027.20 DA	7,524,753.60 DA
Impôts	-	-	-	15,827,000.00 DA	17,409,700.00 DA	19,150,670.00 DA	21,065,737.00 DA	23,172,310.70 DA
Autres dettes	-	-	-	10,068,000.00 DA				
PASSIFS COURANTS	-	-	-	25,895,000.00 DA	17,409,700.00 DA	19,150,670.00 DA	21,065,737.00 DA	23,172,310.70 DA
TOTAL PASSIF	-	-	-	137,130,400.00 DA	182,613,218.67 DA	246,315,910.93 DA	318,986,776.80 DA	401,877,079.60 DA
Verification de l'équilibre Actif/Passif	-	-	-	-	-	-	-	-

Appendix No2

Table of calculations of expected results

2.1 Table showing the work number in the optimistic case

Produit A destiné Client	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Quantité produit A				350,000.00 DA	385,000.00 DA	423,500.00 DA	465,850.00 DA	512,435.00 DA
Prix HT produit A				200.00 DA	200.00 DA	200.00 DA	200.00 DA	200.00 DA
<i>Ventes produit A</i>	-	-	-	238.00 DA	238.00 DA	238.00 DA	238.00 DA	238.00 DA
CHIFFRE D'AFFAIRES GLOBAL	-	-	-	83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA

2.2 Table showing the work number in the pessimistic case

Produit A destiné Client	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Quantité produit A				30,000.00 DA	33,000.00 DA	36,300.00 DA	39,930.00 DA	43,923.00 DA
Prix HT produit A				200.00 DA	200.00 DA	200.00 DA	200.00 DA	200.00 DA
<i>Ventes produit A</i>	-	-	-	238.00 DA	238.00 DA	238.00 DA	238.00 DA	238.00 DA
CHIFFRE D'AFFAIRES GLOBAL	-	-	-	7,140,000.00 DA	7,854,000.00 DA	8,639,400.00 DA	9,503,340.00 DA	10,453,674.00 DA

Appendix No3

calculations for expected output

En Milliers DZD	REALISATION			PREVISION				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
Vente et produits annexes				83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Production de l'exercice	-	-	-	83,300,000.00 DA	91,630,000.00 DA	100,793,000.00 DA	110,872,300.00 DA	121,959,530.00 DA
Achats consommés				1,400,000.00 DA	1,540,000.00 DA	1,694,000.00 DA	1,863,400.00 DA	2,049,740.00 DA
Consommation de l'exercice	-	-	-	1,400,000.00 DA	1,540,000.00 DA	1,694,000.00 DA	1,863,400.00 DA	2,049,740.00 DA
Valeur ajoutée d'exploitation	-	-	-	81,900,000.00 DA	90,090,000.00 DA	99,099,000.00 DA	109,008,900.00 DA	119,909,790.00 DA
Charges de personnel				10,068,000.00 DA	10,571,400.00 DA	11,074,800.00 DA	11,578,200.00 DA	12,081,600.00 DA
Excédent Brut d'Exploitation	-	-	-	71,832,000.00 DA	79,518,600.00 DA	88,024,200.00 DA	97,430,700.00 DA	107,828,190.00 DA
Dotations aux amortissements, Provisions				6,517,333.33 DA	6,517,333.33 DA	6,517,333.33 DA	6,164,000.00 DA	6,164,000.00 DA
Résultat opérationnel	-	-	-	65,314,666.67 DA	73,001,266.67 DA	81,506,866.67 DA	91,266,700.00 DA	101,664,190.00 DA
Charges financières				2,461,368.00 DA	1,969,094.40 DA	1,476,820.80 DA	984,547.20 DA	492,273.60 DA
Résultat financier	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
Résultat Ordinaire avant impôt	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
<i>TOTAL DES PRODUITS DES ACTIVITES ORDINAIRES</i>	-	-	-	62,853,298.67 DA	71,032,172.27 DA	80,030,045.87 DA	90,282,152.80 DA	101,171,916.40 DA
<i>TOTAL DES CHARGES DES ACTIVITES ORDINAIRES</i>	-	-	-	22,653,701.33 DA	22,895,677.73 DA	23,148,154.13 DA	23,058,847.20 DA	23,335,578.60 DA
RESULTA NET DES ACTIVITES ORDINAIRES	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA
RESULTAT NET DE L'EXERCICE	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA

Appendix No4

Treasury plan

Rubriques	Réalisation			Prévision				
	N-2	N-1	N	N+1	N+2	N+3	N+4	N+5
<i>Résultat net de l'exercice</i>	-	-	-	40,199,597.33 DA	48,136,494.53 DA	56,881,891.73 DA	67,223,305.60 DA	77,836,337.80 DA
Amortissements et provisions -	-	-	-	6,517,333.33 DA	6,517,333.33 DA	6,517,333.33 DA	6,164,000.00 DA	6,164,000.00 DA
Variation des stocks -	-	-	-	8,600,000.00 DA	9,460,000.00 DA	10,406,000.00 DA	11,446,600.00 DA	12,591,260.00 DA
<i>Variation des fournisseurs et autres dettes -</i>	-	-	-	29,561,848.00 DA	29,069,574.40 DA	28,577,300.80 DA	28,085,027.20 DA	27,592,753.60 DA
<i>Flux de trésorerie générés par l'activité (A)</i>	0	0	0	12,720,416.00 DA	22,009,586.80 DA	32,193,257.60 DA	44,420,878.40 DA	56,670,844.20 DA
Décassements sur acquisition d'immobilisations	-	-	-	31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
Flux de trésorerie liés aux opérations d'investissement (B)				31,880,000.00 DA	25,362,666.67 DA	18,845,333.33 DA	12,328,000.00 DA	6,164,000.00 DA
<i>Remboursements capital ASF (en valeur nominale)</i>	-	-	-	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA	7,032,480.00 DA
<i>Flux de trésorerie liés aux opérations de financement (C)</i>	-	-	-	101,241,552.00 DA	155,701,944.27 DA	218,155,940.13 DA	289,404,012.60 DA	370,680,015.30 DA

Appendix No5

Business Model Canvas Table

Key Partners	Key Activities	Key Resources	Value Propositions
Suppliers	Product Development	Human Resources	Sustainability
Public Bodies	Research and Development	Physical Resources	Efficiency
Research Institutions	Marketing and Sales	Intellectual Resources	Innovation
Financial Institutions	Distribution	Financial Resources	Economic Impact
NGOs	Partnership Management		Environmental Protection
Community Organizations			

Customer Relationships	Channels	Customer Segments	Cost Structure	Revenue Streams
Support Services	Direct Sales	Farmers and Agricultural Businesses	Fixed Costs	Direct Sales
Educational Programs	Partnerships	Government and Public Sector	Variable Costs	Grants and Subsidies
Community Engagement	Online Platform	Non-Governmental Organizations	R&D Costs	Partnership Agreements
Feedback Mechanisms	Workshops and Seminars	Research and Educational Institutions	Operational Costs	Training Programs
		Local Communities		

Business model board for the “Green Cocoon” project.**1. Main partners:**

- Suppliers: Suppliers of recycled cardboard, natural fibers, technical backfilling of waste.
- Public bodies: Ministry of Agriculture, Ministry of Environment, Local Government Units, Forestry Governorate.
- Research institutions: universities and laboratories specialized in agriculture and sustainability.
- Financial institutions: banks, green funds and impact investors.
- Non-governmental organizations: environmental and agricultural development organizations.
- Community organizations: local agricultural cooperatives and community groups.

2. Main activities:

- Product development: Design and produce green cocoons using recycled materials.
- R&D: Continuous improvement of cocoon technology.
- Marketing and Sales: Promoting the product to farmers, NGOs and government agencies.
- Distribution: Manage logistics and supply chain for delivery of cocoons.
- Partnership Management: Building and maintaining relationships with key partners and stakeholders.

3. Key Resources:

- Human resources: skilled labor for production, R&D team, marketing and sales personnel.
- Physical resources: manufacturing facilities, production equipment, raw materials.
- Intellectual resources: patents, proprietary technology, and brand reputation.
- Financial resources: investment capital, grants, loans.

4. Value propositions:

- Sustainability: Use recycled materials to reduce environmental impact.
- Efficiency: Optimal use of water to improve seedling survival rates in arid areas.
- Innovation: Updating old technologies to improve resource management.
- Economic Impact: Creating local job opportunities and stimulating the economy through sustainable practices.

- Environmental protection: enhancing biodiversity, improving soil and water quality, and reducing greenhouse gas emissions.

5. Customer relations:

- Support Services: Providing installation assistance and technical support.
- Educational programmers': providing training on sustainable agricultural practices.
- Community participation: Involving local communities in tree planting initiatives.
- Feedback mechanisms: Collect customer feedback to improve the product.

6. Channels:

- Direct selling: selling directly to farmers and agricultural companies.
- Partnerships: Cooperation with non-governmental organizations and government projects.
- Online platform: Leverage e-commerce to reach a wider audience.
- Workshops and seminars: Conduct educational and promotional events.

7. Customer segments:

- Farmers and agricultural companies: especially those in arid and semi-arid regions.
- Government and public sector: Ministries of Agriculture and Environment, especially the Forestry Preserve.
- NGOs: NGOs that focus on the environment and sustainability.
- Research and educational institutions: universities and research laboratories.
- Local communities: community groups involved in reforestation and landscape conservation.

8. Cost Structure:

- Fixed costs: manufacturing facility rent, salaries of permanent employees, equipment maintenance.
- Variable costs: raw materials, facilities, logistics and marketing expenses.
- Research and development costs: continuous investment in product improvement and innovation.
- Operational costs: the day-to-day expenses of running a business.

9. Revenue streams:

- Direct sales: revenues generated from selling green cocoons to various customer segments.
- Grants and subsidies: funding from government and environmental grants.

- Partnership agreements: income from cooperation with non-governmental organizations and government projects.
- Training programs: fees for holding workshops and educational seminars.

Appendix No6

الجمهورية الجزائرية الديمقراطية الشعبية
République Algérienne Démocratique et Populaire
وزارة التعليم العالي والبحث العلمي
Ministère de L'enseignement Supérieur et de La recherche Scientifique

Université de Ghardaïa
Faculté des Sciences et de la Technologie
Département d'hydraulique et de génie civil

إذن بطباعة مذكرة ماستر

بعد الاطلاع على التصحيحات المطلوبة لمحتوى المذكرة المنجزة بغرض إنشاء مؤسسة ناشئة المنجزة من طرف الطالبين:

برمان نائل معاذ
أولاد العبد عبد القادر
تخصص ري حضري

نمنح نحن أعضاء لجنة المناقشة:

الاسم واللقب	الرتبة والجامعة الأصلية أو المؤسسة	الصفة	الامضاء
مشري بشير	أستاذ مساعد أ ب جامعة غرداية	رئيسا	
مباركي محمد الطاهر	أستاذ محاضر ب ب جامعة غرداية	مشرفا ومقررا	
لشهب السنة	أستاذ محاضر ب ب جامعة غرداية	ممتحننا	
عجيلة محمد	أستاذ التعليم العالي ب جامعة غرداية	ممثل الحاضرة	
مصباح سعيد	أستاذ مساعد ب ب جامعة غرداية	ممثل الحاضرة	
شبيبي بحري	أمين عام الغرفة الفلاحية غرداية	ممثل الشرك الاقتصادي والاجتماعي	

الإذن بطباعة النسخة النهائية لمذكرة الماستر مؤسسة ناشئة تحت عنوان:

The effectiveness of relying on green cocoons on the environment and the economy in dry areas

قسم الري
امضاء رئيس القسم
والتدوين
بوعلي الطيب
رئيس قسم الري
و الهندسة المدنية