
Professional Practice 2

Responsible Innovation Project

Project Overview

Version 3.0

Responsible Innovation Project	Version: 3.0
Project Overview	Date: 20 May 2021
Workshop 04 – Group 03	

Revision History

Date	Version	Description	Author
4 March 2021	1.0	First version of project overview	Qixuan Ren, Yifei Tao
15 April	2.0	Second version of project overview	Fei Wu, Xi Chen, Yuexin Chen
16 May 2021	3.0	Final version of project overview, modified format	Xi Chen

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Project Overview

1. Project Summary

1.1 Project Goal

To analyse how Digital Earth Africa uses innovative technologies to help the South Africa government ensure food security as well as considering socio-ecological sustainable development.

1.2 Project Purpose

Digital Earth Africa (hereinafter called 'DE Africa') is an organization that aims to use Earth observations and analysis tools to deliver decision-ready products to ensure food security in Africa and develop a socio-ecological system for innovation.

This project aims to analyse how DE Africa can ensure the food security and agriculture development of South Africa on the basis of maintaining socio-ecological sustainable development. This project will focus on the utilization of DE Africa in agriculture, including Cropland Mapping Service, Crop Health Analysis Tool, and other tools DE Africa will develop in future. This project will introduce the current situation of food security in South Africa, analyse how DE Africa project helps ensure food security by utilizing specific products and technologies, and describe our concerns and possible solutions in socio-ecological sustainable development in the process of using innovative technologies.

1.3 Project Challenge

The main challenge in our project is to better integrate South Africa's food security issues with DE Africa project, investigating and considering existing or possible risks that threaten socio-ecological sustainable development, and find possible corresponding solutions. We defined several aspects of problems:

Food inequality: By reviewing government data and various research papers, we found that although South Africa's overall national strength compares favourably with other African countries, its agricultural production clearly shows a shortage of supply.

Natural disasters: According to our research and recent news reports, food security in South Africa is still largely affected by natural disasters.

Land policy: We reviewed government websites, work reports, and current political messages and selected two areas to analyse the impact of policy on food security.

(Detailed description refer to Section 4 in Project Report)

1.4 Point of View

The South African government needs to ensure food security and agriculture development on the basis of maintaining socio-ecological sustainable development because they lack the ability to scientifically and systematically make

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analysis and decisions.

1.5 Project Client

The primary client in our project is the South African government. In order to ensure the basic temperature saturation of the people and promote the development of the country's agricultural industry, the government has a strong need to solve the problem of food security. At the same time, the scientific decision-making and macro-guidance of the South African government have played a significant role in solving food security issues. In terms of national policies, such as land policies, import and export policies, and natural disaster prevention policies, the government uses more scientific and systematic decision-making methods to make policies meet actual needs and solve problems in a timely manner. In terms of science and technology, the state promotes the development of agricultural technology and strengthens the construction of agricultural infrastructure, which is conducive to fundamentally improving the level of agricultural development and is also conducive to the sustainable development of agriculture.

In addition, the government has a leading responsibility to ensure the sustainable development of African society and ecology. While introducing new technologies and developing the country's agricultural industry, the government also needs to measure the factors affecting sustainable development and analyse risks and impacts.

More information about the client can be found in the file Project Client Map and Value Proposition Canvas in our group repository.

1.6 Working Title for the proposed project

The working title for the project is 'Digital Earth Africa with South Africa Food Security'.

1.7 Project Schedule

The project is expected to commence on 02/25/2021 and be completed by 05/16/2021.

2. Project Overview

2.1 Key Stakeholders

The key stakeholders of this project include the government of South Africa, farmers, DE Africa, agricultural companies, partners of DE Africa, the United Nations, international partners, and SDG Centre of Africa.

2.2 Challenge Assessment

- The key point is how can we combine DE Africa to improve the food security and agriculture development of South Africa on the basis of maintaining socio-ecological sustainable development.

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- DE Africa has more precise and advanced tools, such as satellite imagery, crop-based services (monitor their land vegetation), and the crop health analysis tool (track the health and growth of crops as they mature). As well as these monitoring data could make the government and farmers working on African agriculture effectively.
- Other solutions include developing food-related policies, controlling population growth, solving farmers' financial crisis, and artificial intelligence vegetable greenhouses. The digital technology of this project can be realized.

2.3 Situation Assessment

Many business and environmental factors have influenced the proposed project.

- Some food companies, freight companies are hoping to benefit from this project improving Africa agriculture.
- People want better food security. And farmers want better farming and more food production
- Governments and relevant organizations can use the project to obtain relevant data analysis, which can better make decisions to help agriculture sustainable development.
- Current problems include uneven food production, natural disasters (including drought, insect, epidemic), and land issues. However, new technologies can be used to monitor and prevent environmental and human-induced damage to agriculture

There are many clients have been involved in the Digital Earth Africa, including

- Dynamic agriculture market between and within each African country will directly benefit from this project, as they lack strong government regulations and effective market self-supervision.
- Active farmers in the market economy are prospectively expecting African continent to become a net exporter of agriculture products. With the sufficient aid of this project, farmers and crop producers can analyse the current global agricultural economic situation, so as to better analyse the benefits that crop exports can bring to them.
- With DE Africa, investors and public funding organisations can analyse better specific policies and strategies to commit into the agriculture sector, including livestock rearing, forest resources and fisheries.
- Financial institutions who provide access to credit and insurance can utilise business intelligence dashboard to conduct financial data analysis, for the purpose of increasing possibility for more loans.

2.4 Consultation

- A survey of many South African agricultural reports
- Interviews with agricultural technicians of South Africa
- Questionnaire survey for some population groups (Mainly targeting farmers)

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3. Proposed Scope

Based on the information outlined above, begin to scope the project and describe how the project will be managed. The information in the following subsections is important, as they will form the basis of a Project Business Plan if the project recommendation/innovation is developed.

Table 1: Digital Earth Africa with South Africa Food Security Proposed Scope

Element	Detail
POV	In Africa, food security issues create a huge gap between food demand and production. In order to increase food production and reduce other potential security risks, we analysed the corresponding technology given by Digital Earth Africa, to ensure food security and promote sustainable agriculture.
Outcome	The South African government needs to ensure food security and agriculture development on the basis of maintaining socio-ecological sustainable development because they lack the ability to scientifically and systematically make analysis and decisions.
Output	Use Sandbox simulation technology provided by DE Africa for reasonable land allocation and crop growth management, thus further increase production. The output is believed to cover the analysis of tillable land use, water consumption, natural disasters and pests, crop health and soil moisture.
Quality Criteria	According to the goals set by the South African government for rational land use, soil management and crop health monitoring, combined with the crop yield results after data analysis using DE Africa, carry out quality analysis and benchmark analysis.
Customer(s)	The South African Government, local farmers, and citizens.

User requirements for the Digital Earth Africa with South Africa Food Security project have been sourced from Digital Earth Africa. User requirements identified to date are detailed in Table 2 below.

Table 2: Digital Earth Africa with South Africa Food Security User Requirements

Requirement	Owner	Priority
Improve productivity	The South African Government Farmers Citizen	High
Considering sustainable development	The South African Government	High

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Technical requirements for the Digital Earth Africa with South Africa Food Security project have been sourced from Digital Earth Africa. Technical requirements identified to date are detailed in Table 3 below.

Table 3: Digital Earth Africa with South Africa Food Security Technical Requirements

Requirement	Owner	Priority
Data promptness and accuracy in techniques	Digital Earth Africa	High
Data Security	Digital Earth Africa	High

3.1 Assumptions

The main assumptions are:

Tillable land usage, water resource consumption, natural disaster and insect pests, crop health and soil moisture.

3.2 Constraints

The main constraints are:

Labour resources, war, finance, urbanization, import/export policies

4. Risk Assessment

Risks are known or unknown factors affecting the project, for example potential costs, resources, timelines that may not be met or delivered upon (see more here, <https://www.pmi.org/learning/library/risk-analysis-project-management-7070>).

Risk assessments for the Digital Earth Africa with South Africa Food Security project are detailed in Table 4 below.

Table 4: Digital Earth Africa with South Africa Food Security User Requirements

Identified risk event	Risk probability	Risk impact
- Category: External COVID-19 will delay the process of the project and affect the budgets, resources dependencies of the project.	High probability (80%~100%)	Rating A - 100
- Category: Technical Low quality of data from DE Africa which causes our project to make wrong data analysis	Medium-high probability (60%~80%)	Rating B - 50

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- Category: External Supplier cannot supply the requirements of project which delay the process of project	Medium-high probability (60%~80%)	Rating B - 50
- Category: Organizational Project has serious dependencies with the DE Africa. Once DE Africa gets influence, it will affect whether our project can be going on.	Medium-low probability (30%~60%)	Rating A -100

Proposed Budget

Proposed budget for the Digital Earth Africa with South Africa Food Security project is detailed in Table 5 below.

Table 5: Digital Earth Africa with South Africa Food Security Proposed Budget

Expense	Budget Category	Budget	Actual
- \$1,311	Hardware facilities	+ \$2,000	\$1,400
- \$5,000	Labour Cost	+ \$8,000	\$4,300
- \$1,200	Investigation Validation	+ \$2,000	\$2,100
- \$1,200	Natural calamities protection (per farm)	+ \$1,500	\$2,200
- \$11,250	Backup facilitates	+ \$12,000	\$1,100

5. Project Milestone

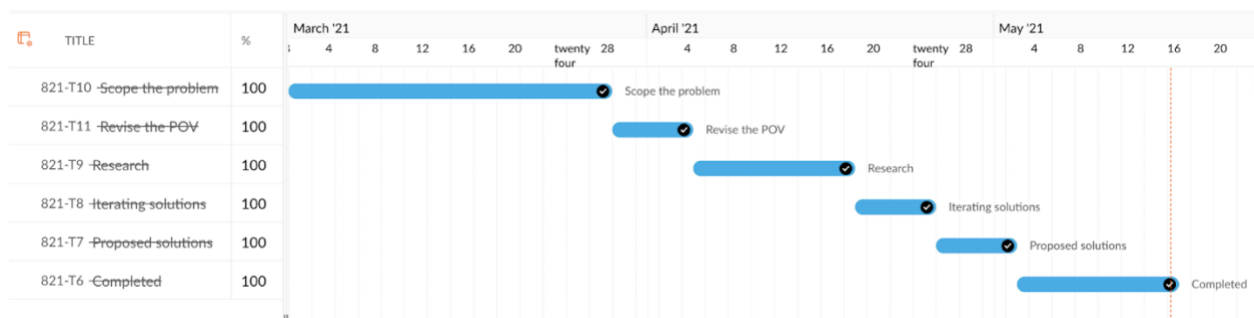
Our project is dedicated to using design tools to solve the Client's problem - Food security in South Africa. Firstly, we spend the first 4 week scoping the problem and defining the project goal. Then, in week 5, we revise the project overview. In week 6 - 7, our team decided to do research on different problems. To brainstorm and iterate the solutions, we use methodologies to evaluate all possible solutions in week 8. In week 9, we met our mentor and discussed our proposed solution. After that, our team will complete the review of the report and the responsible innovation project. The timetable of the project is shown as follows in Table 6 and Figure 1.

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Table 6: Digital Earth Africa with South Africa Food Security Timetable

Subjects	Duration (weeks)
Scope the problem	1 - 4
Revise the POV	5
Research	6 - 7
Iterating solutions	8
Proposed solutions	9
Completed	10 - 12

Figure 1: Digital Earth Africa with South Africa Food Security Gantt chart



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Team Member Sign Off:

I have participated in the development or review of this charter and agree to it.

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Seminar tutor: _____

Date: 2021.05.16