



**MASSIVE ONLINE OPEN COURSE:
ECONOMICS OF LAND DEGRADATION**

**NANSANGA FARM BLOCK COST-BENEFIT
ANALYSIS**

ENVIRONMENTAL MODELLING TEAM

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INTRODUCTION

Nansanga Farm Block is located in Central Province in the Republic of Zambia, being one of the 9 farm blocks established by the government in 2002. It covers an area of 155,000 ha within the third ecological zone in Zambia. The project was established in order to boost economic growth and diversification commercializing agricultural land, enhance food security and reduce poverty.

The area is rich in resources: a miombo woodland, fertile soils, abundant rainfall, streams and a national park nearby. It is relevant for its cultural heritage, being inhabited by the Lala people.

Due to strong environmental concerns, we present in the following document a cost-benefit analysis for a project that includes two possible scenarios in order to protect, maintain and preserve the natural resources of the ecological zone in which Nansanga Farm Block is located and the integrity of the inhabitants of the region.

COST-BENEFIT ANALYSIS

Description of scenarios

Scenario 1: For this scenario the land used for agriculture and grazing is reduced in 25% for reforestation to reverse land degradation improve soil quality, minimize soil erosion and improve on the ecosystem services such as clean air, water balance and the life cycle and life cycle. Payments for ecosystem services will be given to landowners.

Without project

Costs:

- Agriculture methods and supplies
- Inputs for economic activities such as agriculture and cattle that the Lala people would be involved in.
- Technical assistance.
- Labor force in ecotourism and other inputs.

Benefits:

- Income obtained from crops and other products:

Average yield per ha of maize for smallholder farmers in about 1.5 tons/ha. An

estimation that about at least about 65% of NFB (155, 000ha) is cultivated is considered. Therefore, there are 100,750 ha cultivated yielding about 151,125tons of maize.

From recent prices of maize, 50kg = K65 (~\$10USD).

Total income: ~\$30,225,000 (151,125tons * \$10 / 0.05tons (50kg/1000))

The same approximations apply to products such as caterpillars, cassava, groundnuts, sorghum and other products.

- Income obtained from ecotourism packages:

In average, a tourist's package costs 60USD (accommodation, transportation and food), each year there is an average of 500 visitors in Serenje, giving a total of 30000 USD per year.

With project

Costs:

- Number of hectares (25% of land that was previously used) x 50 USD per year as cost of maintenance and restoration of soil and woodland and investment in trees.
- Agriculture methods and supplies
- Inputs for economic activities such as agriculture and cattle that the Lala people would be involved in.
- Technical assistance.
- Marketing campaigns to obtain funds and promote ecotourism as well as consumption of regional products.
- Labor force in ecotourism and other inputs.

Benefits:

- Income obtained from crops and other products with an increase in price of 10% each.
- Income obtained from ecotourism packages with an increase in price of 10%.

In average, a tourist's package costs 60USD (accommodation, transportation and food), each year there is an average of 500 visitors in Serenje and the price of each package would be increased in 10% giving a total of 33000 USD per year.

- Number of hectares (25% of land that was previously used) x 50 USD per year for each landowner.

Scenario 2: For this scenario the land used for agriculture and grazing is reduced in 50% for reforestation to reverse land degradation, improve soil quality, minimize soil erosion and improve on the ecosystem services such as clean air, water balance and the life cycle. Payments for ecosystem services will be given to landowners.

Without project

Costs:

- Agriculture methods and supplies
- Inputs for economic activities such as agriculture and cattle that the Lala people would be involved in.
- Technical assistance.
- Labor force in ecotourism and other inputs.

Benefits:

- Income obtained from crops and other products:

Average yield per ha of maize for smallholder farmers in about 1.5 tons/ha. An estimation that about at least about 65% of NFB (155, 000ha) is cultivated is considered. Therefore, there are 100,750 ha cultivated yielding about 151,125tons of maize.

From recent prices of maize, 50kg = K65 (~\$10USD).

Total income: ~\$30,225,000 (151,125tons * \$10 / 0.05tons (50kg/1000))

The same approximations apply to products such as caterpillars, cassava, groundnuts, sorghum and other products.

- Income obtained from ecotourism packages:

In average, a tourist's package costs 60USD (accommodation, transportation and food), each year there is an average of 500 visitors in Serenje, giving a total of 30000 USD per year.

With project:

Costs:

- Number of hectares (50% of land that was previously used) x 50 USD per year as cost of maintenance and restoration of soil and woodland and investment in trees.
- Agriculture methods and supplies
- Inputs for economic activities such as agriculture and cattle that the Lala people would be involved in.
- Technical assistance.
- Marketing campaigns to obtain funds and promote ecotourism as well as consumption of regional products.
- Labor force in ecotourism and other inputs.

Benefits:

- Income obtained from crops and other products with an increase in price of 10% each.
- Income obtained from ecotourism packages with an increase in price of 10%.

In average, a tourist's package costs 60USD (accommodation, transportation and food), each year there is an average of 500 visitors in Serenje and the price of each package would be increased in 10% giving a total of 33000 USD per year.

- Number of hectares (50% of land that was previously used) x 50 USD per year for each landowner.

DECISION

Both scenarios including the project will have a positive net present value as we have included several financing sources which enable a sufficient amount of benefits to be gathered.

Even so, the best option is **Scenario One with project** as the proportion of hectares used by landowners differs. Some landowners have shown concern about the uses of their land as some own smaller plots. For the majority of landowners, receiving a payment to compensate for the opportunity cost of not using 25% of their land is reasonable.

IMPLICATIONS OF PROJECT SCENARIOS FOR POLICY MAKING IN NANSANGA FARM BLOCK

Besides the previously mentioned benefits in economic terms for each scenario, the social and ecological benefits include:

- Fertile soil
- Increase in biodiversity- linked to ecotourism and aesthetic benefits
- Higher quality air and water cycles with less pollution
- More sources of income for Lala people, other farmers and investors
- Reduction of expenses for agricultural chemicals

The valuation of projects in Nansanga Farm Block provides to all stakeholders a tool to evaluate the current socio-economic outlook of the inhabitants of the block as well as surrounding areas and the environmental concerns within the region. Policy makers are given two profitable options that benefit all participants and help increase the quality of life of inhabitants and natural resources, preventing further damage to the environment. Economic growth in Zambia is promoted, as well as the cultural assets in the long run.