Noah’s Ark Project

Feasibility Study

Revision 0.5.2a

(2 February 2026)

Revision register

Rev.	Date	Details
0.0	14 Sep 2022	Original version
0.1	3 Aug 2023	All prices converted to USD at a rate of 17.9 ZAR/USD. Inflation rate set to 3%pa.
0.2	13 Sep 2023	Project site moved to Zanzibar, project development costs revised, all other features and costs remain the same.
0.3.2	22 Dec 2023	The project site is offered as Zanzibar and Tanzania together, with notes on the option of undertaking Zanzibar alone
0.3.3	28 Jan 2024	The Executive Summary is rewritten to present the proposal more succinctly
0.3.4	31 Jan 2024	New revision
0.3.5	2 Feb 2024	Executive Summary – (a) the Zanzibar Expenditure table is re-inserted, (b) text is added to expound on the Concert table
0.4	18 Sep 2024	Executive Summary – Updated
0.5	5 Sep 2025	Tables are renumbered. And Tables !b to 3b are added for Entry Level funding
0.5.2	29 Jan 2026	Project Phasing and Funding updated in line with investment Plan and Timeline
0.5.2a	2 Fen 2026	Correction p2 vertebrate

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Scapha (Pty) Ltd

Executive Summary

The Latest News on Biodiversity and Climate Change

The Noah's Ark project is to save wild vertebrate animals from extinction, and with that the whole of wild nature. Which is *the* most vital climate change action, over electric cars, wind farms or whatever else manmade, even more important than green economies. There is much more to this, as this news tells, such as closing the wealth gap globally with ending poverty, and with that the security threat from mass asylum migration (3 million in 2024). Not a regional project as conservations tend to be but one with a big footprint, that will (and must) potentially extend across Africa and even pan globally.

COP30 – actions on maintaining plans to combat climate change in line with the 2015 Paris Agreement, climate finance, and a reference to aligning global trade with climate objectives.

BBC (Jan 2026) – Trump withdraws US from key climate treaty and dozens of other groups. These latest withdrawals come after the president took the US out of the Paris Climate Agreement for a second time last year, and declined to send a delegation to the COP30 climate summit in Brazil.

UN environmental programme, finance initiative – Action on nature: what can financial institutions expect in 2026? With USD 700 billion needed each year to protect and restore nature and over half of global economic value generation moderately or highly dependent on natural systems, closing the nature finance gap presents both a significant challenge and a major opportunity for the finance sector.

United Nations (May 2025) – UN Secretary -General Antonio Guterres 'Biodiversity loss is a global crisis no nation can ignore'

The Guardian (Jan 2026) – Biodiversity collapse threatens UK security, intelligence chiefs warn. Ecosystem destruction will increase disorder and mass migration, with effects already being felt

The Ecologist (Jan 2026) – Biodiversity loss 'threat to security'. Security experts join the dots between nature loss, security and the wellbeing of society.

euronews (Jan 2026) – Security threatened by biodiversity loss, intelligence chiefs warn

Environment Journal (Jan 2026) – Last week **Defra** (UK Dept for Environment, Food & Rural Affairs) made headlines with a global biodiversity report pointing to the collapse of ecosystems as a trigger risk to national security. It should be a wake-up call. The analysis rightly highlights threats to global stability, food systems and geopolitical resilience; projecting competition over imports and mass global migrations that pose grave diplomatic challenges and increase the likelihood of conflict.

The Guardian (Jan 2026) – How climate crisis has reshaped Britain's flood risk

Japan Today (Jan 2026) – King Charles III warns 'world going backwards' in climate fight

THE NOAH'S ARK PROJECT

OBJECTIVES

- Remote protection of vertebrates critically endangered in wild ecosystems worldwide, along with interdependent animal and plant species, and the sustained rewilded repatriation of lost species well beyond those lands achieve ongoing CBD (Convention of Biological Diversity) targets.
- Design and build state-of-the-art conservation parks with the express aim of fulfilling the above, initially in Tanzania and Zanzibar.
- Develop those parks as action centres (lifeboats) around the world, strategically to engage populations more widely in the benefits and, as essentially, to protect biodiversity from extinction.
- Motivate change, through working with media in re-programming humanity's relationship with the planet.
- Develop and support fundraising projects
- Help economies and indigenous people through employment programmes aimed at: community investment, upliftment, and infrastructure development.

COMPANIES

- **The Noah's Ark Foundation** NPO registration UK in process, RSA 2019/480584/08
- **SCAPHA Ltd** For profit registration UK 15296452
  Richard Curson President, Hein Prinsloo Vice President, George S Boughton Operations Director, Sonia Libaert-Cox Change Management Director, Marc Sharifi Director

PRIMARY STAKEHOLDERS (all provisional subject to T&C and funds) –

- **Governments of Tanzania and Zanzibar** – Support in all regulatory procedures, establishing the territory as a world centre in conservation, with the provision of lands FOC
- **Jason Hargreaves** Investment Consultant
- **Giles Cooper** (Chairman, Royal Variety Charity and Executive Producer, Royal Variety Performance) – Joint Head of Promotions (Entertainment & Concerts)
- **Spencer Phillips** (Chair, Cheetah Conservation Fund) – Joint Head of Promotions (Entertainment & Concerts)
- **Arup**, Caroline Ray Regional Director, Arup East Africa – Design of capital works
- **Walters & Cohen**, Cindy Walters Director – Design of capital works
- **TNAF/Scapha Tanzania**
  John Diefendorf - Communications & Government Liaison, Online Education, IT*
  Phillip Saliboko
  Charles Samuel (Makai Enterprises)
  Kitty Narraidu
  Polica Kgaugelo Sekhwela
- **Wildlife conservation specialists**
  Du Toit Livestock, Ladysmith, South Africa
  Spencer Phillips (Chair, Cheetah Conservation Fund), UK
  Claus Schmidt (Owner, Animal Press), Germany
  Christopher Ritchie (owner Pet & Vet, released Mar 2024), UK

Sean Hensman (Director, Adventures with Elephants), South Africa
John Akeroyd (Botanist), UK
Caroline Ray (Regional Director, Arup East Africa, and climate change champion)
John Sauvage, veterinary surgeon, UK

- **Indigenous Communities**
  Local communities in **Tanzania and Zanzibar** (providing essential facilities)

EARLIER PROMOTIONS

Noah's Ark TV Series 1 password, (confidential): youarenoah! Free with *You are Noah! Introduction*	Book & Good Morning Britain *You are Noah! Introduction*	Music singles (example) Ark 4 Africa - It Takes the World to Make a Miracle (Official Music Video)

PROJECT PHASING and FUNDING

Support has been received in-principle from the Government of Zanzibar, including the provision of land. Full commitment is pending Commitments on Funds. Upcoming audiences are expected to secure the same from the President and Vice President of Tanzania.

HOAs have been signed with Giles Cooper and Spencer Phillips, to head promotions in media and TV, songs, books and benefit concerts, and to take charge of revenue collection for the whole Project including park entry ticketing with tour operators. Included are commitments to achieve KPIs in line with this Study. T&Cs to be negotiated will ensure that Project revenue sustains the Project long term.

Draft terms have been received from Arup and Walters & Cohen for design of capital works.

Total capital expenses for building parks in **Tanzania and Zanzibar** are projected at $2.4b over a 10 year period of operations. Revenues are expected to more than adequately cover operating costs, resulting in a projected IRR exceeding 30-35%.

PROJECTED PROJECT CASH FLOW – TANZANIA AND ZANZIBAR PARKS

Tables below present Expenditure and Revenue in the first 3 years for:

- 1a to 3a, the **Full Project in Tanzania and Zanzibar**
- 1b to 3b, **Entry Level Funding** for the **Project just in Zanzibar** initially. This is based on an initial investment of £5m ($6m), securing DFI loans of £11m ($15m). Major attractions – the domes, museum and conference centre in Zanzibar all phased later than in the Full Project, but brought forward as investment in the Project grows to implement the Full Project. The attractions can all be built, due to the very large revenue for the Full Project being available to this entry level.

The total of $139.0m (£100m), in year -2 of Table 3a, is the funding sought to commence design and build for the parks along with undertaking associated promotions. Investment in the amount of 30% ($42m or £30m) secures DFI loans of 70% ($97m or £70m)

TANZANIA AND ZANZIBAR – Full Project

CAPITAL EXPENDITURE	$m			
Year (provisionally in)	-2 (2028)	-1 (2029)	0 (2030)	
Project Development	25.7	13.2	31.8	Mainly Design & Project Management by Arup (fees 6% of cap exp) and PR Campaign with TV series produced by Hearst Media Production Group, $5m in year -2
Land related costs	5.0			
Buildings & Works	72.9	0.1	211.9	Major attractions: initially 4 domes, 1 large & 3 small in Zanzibar, followed 2 years later by domes in Tanzania – all twice the size of the Eden Project (UK) – also an iconic visitor centre. The Zanzibar park opening to public is in year 0. Payment of works are on staged completions.
Equipment & furniture	4.3	5.0	12.1	
Vehicles	1.4	1.4	7.4	
Animals & plants		4.3	5.7	Major attraction in domes and open areas: endangered animals along with interdependent species from around the world
Contingencies	12.5	1.6	35.6	
Professional fees	10.0	4.0	12.1	Includes fees (3% of cap exp) to the Steering Group for Project funds management and a Steering Group (a world first) for classifying the interdependence of species.
Sub total	131.8	29.6	316.6	
OPERATING EXPENDITURE	17.6	8.9	16.2	
TOTAL EXPENDITURE	149.4	38.5	332.8	

Table 1a. Project expenditure cashflow

REVENUE	$m			Remarks
Year (provisionally in)	-2 (2028)	-1 (2029)	0 (2030)	
ENTERTAINMENT **Promotions, high profile**				Giles Cooper & Spencer Phillips to head promotions and revenue collection with the revenues shown here as KPIs
Visitor entrance ticket sales			-109.8	See section 4 (below) for full details
TV Distribution sales (global, outside USA)		-30.0	-32.3	Distribution of TV series produced by Hearst Media Production Group, to initially to run throughout USA on ABC
Dogtag sales	-9.8	-10.1	-10.5	Key-fob-like promo merchandise on sale at retailers and events worldwide
Music & book sales	-0.5	-2.5	-2.7	Music singles & books by/of A-list stars. Profiles aided by

				Noah's Ark musical (Lion-King-like) to run in West End theatre (London, UK). See section 7.5 (below) on dog-tags.
Brand licensing			-54.1	Lease of Noah's Ark trademark to major organisations. See page 23 (below)
Park sponsors	-0.9	-0.9	-1.0	See section 4.1 (below)
Sub total	-11.2	-43.5	-210.4	
Contingency	0.5	1.9	11.2	
Proceeds from land			-151.5	Hotel sites, food court & retail outlets.
TOTALS	-10.7	-41.6	-350.6	

Table 2a. Project revenue cashflow

Total primary cash flow	138.7	-3.1	-17.8	Covered by investment £30m ($42m) and DFI loans £70m ($97m) Ratio Investment/DFI loans: 30%/70%
Note: On leasing land to hotel operators, an alternative proposal is pending to instead build hotels, or convert existing properties, all for lease to operators.				

Table 3a. Project total primary cashflows

ZANZIBAR – Entry Level Funding

CAPITAL EXPENDITURE	$m			Remarks
Year (provisionally in)	-2 (2028)	-1 (2029)	0 (2030)	
Project Development	12.4	10.1	24.5	See tables 1a to 3a above
Buildings & Works	7.4	8.3	46.3	
Equipment & furniture	0.2	0.7	2.7	
Vehicles	0.1	0.2	1.9	
Animals & plants		1.7	3.9	
Contingencies	1.2	1.6	8.2	
Professional fees	7.1	7.0	8.9	
Sub total	28.4	29.7	96.5	
OPERATING EXPENDITURE	1.3	4.8	13.7	
TOTAL EXPENDITURE	29.7	34.5	110.2	

Table 1b. Project expenditure cashflow

REVENUE				
Promotions, high profile ENTERTAINMENT				
Visitor entrance ticket sales			-11.3	
TV Distribution sales (global, outside USA)		-25.5	-27.4	
Dogtag sales	-8.3	-8.6	-8.9	
Music & book sales	-0.4	-2.2	-2.2	
Brand licensing			-46.0	
Park sponsors	-0.5	-0.5	-0.6	
Sub total	-9.2	-36.8	-96.4	
Contingency	0.5	1.9	11.2	

Proceeds from land			-47.4	
Note: See table 2a note above				
TOTALS	-8.7	-34.9	-132.6	

Table 2b. Project revenue cashflow

Total primary cash flow	21.0	-0.4	-22.4	Covered by investment £5m ($6.5m) and DFI loans £11.5m ($15m) Ratio Investment/DFI loans: 30%/70%
Note: On leasing land to hotel operators, an alternative proposal is pending to instead build hotels, or convert existing properties, all for lease to operators.				

Table 3b. Project total primary cashflows

PROJECTED PROJECT CASH FLOW – PROJECT CONCERTS

The objective of the series of benefit concerts is to boost revenues in Table 3, with the first concert and subsequently through the whole life of the Project, with adding substantially to cashflows and to the sustainability of the whole Project long term. Essentially, the first park has to open to the public as soon as is possible after the first concert is performed and all the promotional materials in table 3 are sold. That means development of the parks has to get underway in tandem with production of the first concert, if not sooner.

As with the parks, the overriding objective is saving endangered wild animal species from extinction.

CONCERT SERIES (Annual)					
	$m				Remarks
Year (provisionally in)	-3 (2027)	-2 (2028)	-1 (2029)	0 (2030)	
REVENUE – 1st Concert					1st benefit concert in series, comparable in scale with Live Aid (1985), with Giles Cooper & Spencer Phillips jointly as Promoter.
Gross sales		-150.0	-250.0		Projected sales are scaled down from Live Aid, to be conservative
Production Budget	50.0	78.0			
Production expenses					
Professional fees	0.5	0.5			
TOTAL	50.5	-71.5	-250.0		
Profit			-271.0		Available to the Noah's Ark Project

Table 5. Project Concerts, 1st performance in series

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1 INTRODUCTION

1.1 Background

The extinction of wild animal species has become a matter of great concern not only within the scientific community, but also security, environment, health and wellbeing, as well as financial institutions and of course the general public throughout the world. There is evidence of a dramatic decline in the numbers and the outlook is that many will disappear altogether within decades.

Major among causes is land conversion to agricultural, forestry, industrial and urbanisation use, and displaced animals having to adapt to new territories and live in harmony with indigenous farms and villages.

Also major is the over-exploitation of wild species for commercial reasons. This is particularly so with animals such as elephants, rhinoceroses, leopards and whales which yield valuable products. The same can be said for a range of botanical species, notably, ebony, African blackwood and cycads, which trade at very high prices.

1.2 The problem to be solved

As the world's population explosion post World War II levels out, and industrialisation catches up globally, urban migrations act to ease pressures on rural areas. Except economies too have been lagging behind. IMF 2026 data on GDP per capita: sub-Sahara Africa and SE Asia under $3k, S America and E Asia under $18k, compared with N America and Europe well over $40k. As those economies catch up they hike demands on consumables production and mining, with a high probability of exhausting resources but also further destroying wildernesses. And while governments fight their fights, and spare little resources to mitigate this problem too, mounting asylum migrations – OECD 3 million in 2024 – now pose a serious security threat as **Defra** warned the UK government (Jan 2026).

The reality is that climate change and asylum can be tackled along with protecting wildernesses on land and in the seas and oceans. That most precious of resources built, and now sustains, this planet's atmosphere and climate. And 'heads are in the sand' thinking that we have the knowledge to replace that highly complex world merely with industrial solutions – electric cars or whatever – or to try managing it. It's imperative that we not only maintain nature fully wild but also build it back to full strength. Once gone, made extinct, it can never be restored. In any case, how beautiful would our green and blue planet be then?

1.3 Analysis of the problem

The task is to raise public awareness, in the face of geopolitical and geo-economical priorities that command attentions otherwise, and to direct funds to mitigate the problem.

Currently, television is the prime medium through which the public obtains information on the environment. A secondary source is the news media and specialist magazines. This has proved to be insufficient to motivate action on a large scale. While both have the merit of being able to reach large audiences, they suffer the disadvantage of providing a somewhat remote and abstract experience of the natural environment. Some additional means is needed to raise the importance of the issue in the minds of the public.

Public opinion is the driving force of change needed, to foster not just green economies but also wilderness economies. China has a green economy, rivalling that of the USA, and also the fastest growth in consumer spending. Other economies should follow that lead, especially with deescalating wars and armaments expenditures, with an emphasis for private sector charities and capital ventures to step up making this planet greener, bluer, wilder.

1.4 The opportunity

The endangered species problem has gained a relatively high awareness profile. Now, there is an opportunity to take this further by providing the public with direct experience of the issues raised in the media.

1.5 The proposition

Actual contact with endangered species and first-hand knowledge of measures being taken for their preservation will be of considerable interest to a large section of the public. Charging fees for the experience will cover a significant percentage of the costs.

There is the potential for high profile corporations and charitable foundations to be interested in associating themselves with the most ambitious nature conservation project in the world.

1.6 Project location and description of the project

The core feature of the project will be four geodesic domes measuring 300m in diameter and reaching a height of 80m. These will recreate the climatic and environmental conditions in major regions around the world (tropical, temperate and polar). Twelve smaller domes will contain environments representing more specific climatic zones, including: deserts, sub-arctic, Mediterranean and highland conditions.

The domes will be supplemented by a natural history museum with interactive displays, multi-sensory activities and lifelike animal holograms to instil a sense of awe, wonder and respect for the natural world.

Supporting infrastructure will include a leisure centre, research centre, visitors' and conference centre, and one each of three, four and five star hotels as well as transport to move visitors between the various points of interest.

Locations proposed for the project are the island of Zanzibar, which lies off the coast of Tanzania some 83km to the north of Dar as Salaam, and Tanzania.

General bulk services would include: fresh water supplies, sewerage and wastewater treatment, solid waste removal, and electricity supply. In addition, offices and residential accommodation will be provided for staff working at the site. These will be provided by local government agencies or by dedicated independent service providers.

Figure 1: Architectural rendering of the project, will be divided between Zanzibar & Tanzania

1.7 Feasibility Study approach

The approach to the development of this Feasibility Study is to consider first the issues associated with the strategy and structure of the organisation in which the project would be contained, then to deal with the management and control of the organisation. This is followed, in logical order, by plans for each of the four major functions that are performed by any economic activity, including Marketing, Operations, Commercial and Finance.

The original version of the Feasibility Study was based on the Noah's Ark park being located in KwaZulu Natal, South Africa. In this revision the basic design and all capital and operating costs are split between two parks, one in Zanzibar and the other in Tanzania, with the option to fund both (Zanzibar and Tanzania) or alternatively just the Zanzibar park to begin with. Other changes incorporated into this report are: the market for the project, the cost of local resources and an increase in the project development costs.

2 ORGANISATION STRATEGY AND STRUCTURE

2.1 Overall strategy

Retaining financial, managerial and operational control is a major task of the project founders. Support by investors, commercial partners and charitable foundations will depend on measures put in place to guarantee financial control of the project, which they will regard as a foreign based direct investment.

The usual measure put in place to counter risks associated with this type of investment is to base ultimate management and financial control of the project in a country that has treaties in place for the protection of foreign direct investments and which has a diplomatic profile that would enable it to influence the regulatory environment within which the project operates. As a practical matter this means an entity for this purpose will need to be established either in the UK, EU or USA.

The entity will receive all equity, loans and donations and subsequently disburse funds, as and when needed, to a locally registered organisation which will be Scapha TZA.

A second strategic issue, the location of the project and the terms and conditions associated with the occupation of sites, are progressing with the governments of Zanzibar and Tanzania. The President of Zanzibar has written with expressing his government's support for the project and stating that their full commitment will be forthcoming upon receipt of a commitment on funds. Arrangements will follow to obtain the same support from the President of Tanzania.

The President of Zanzibar appreciates the economic benefits that will be gained by locating the project there and has stated publicly their aspirations for Zanzibar to become a centre of excellence as well as a venue for international conferences on the conservation of wildlife.

2.2 Business processes

There are five separate business processes within any commercial enterprise. These are:

- Management and control
- Marketing and sales
- Operations
- Commercial
- Finance

Management and control will be the function that coordinates the activities of the other four functions and interfaces with external parties such as major donors as well as central, regional and local government authorities, suppliers of key resources and services and the various other stakeholders that will have an interest in the project.

The Marketing and Sales function will be responsible for bringing the offering of Noah's Ark to the attention of all potential visitors and for managing the visitor experience. All revenues will flow through the Sales division, to be passed through to the Finance function.

Operations is for the management of the installation, including matters such as: the wellbeing of all animal and plant life; operating and maintaining all buildings and facilities; and conservation of wildlife.

Contracts for capital expenditures, supplies and services and human resource functions will be the responsibility of the Commercial function. All payments for goods and services will, however, be made through the Finance function.

The Finance function will be responsible for reconciling cash flows of the organisation and ensuring that it remains solvent at all times. This includes the maintenance of adequate and appropriate insurance cover. To achieve this it will maintain productive relationships with financial institutions and other funding sources. A further responsibility will be to maintain the Noah's Ark project's financial records.

2.3 Corporate Structure

The board of trustees (or directors) of the overseas holding company will be appointed by sponsors of the project. One member will be nominated as chairman of the local operating organisation.

Top management of the local organisation will consist of a Chairman, a Managing Director to whom the Marketing and Sales, the Operations, the Commercial and the Financial Directors will report.

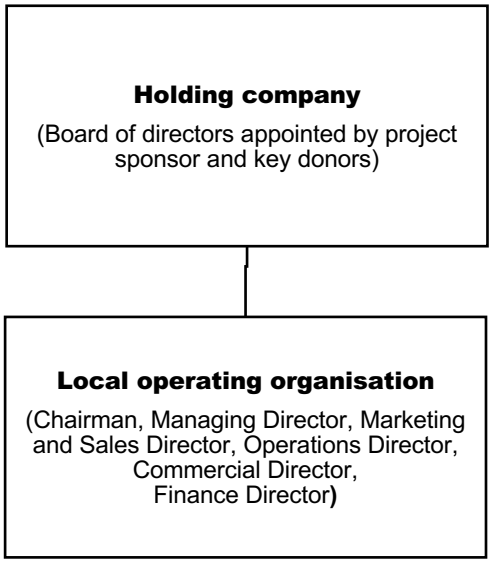

Figure 2: Noah's Ark corporate structure

2.4 Organisation structure

The high level overall organisation structure of the project will be as shown on the figure below. The chart depicts the top and senior management positions in the organisation.

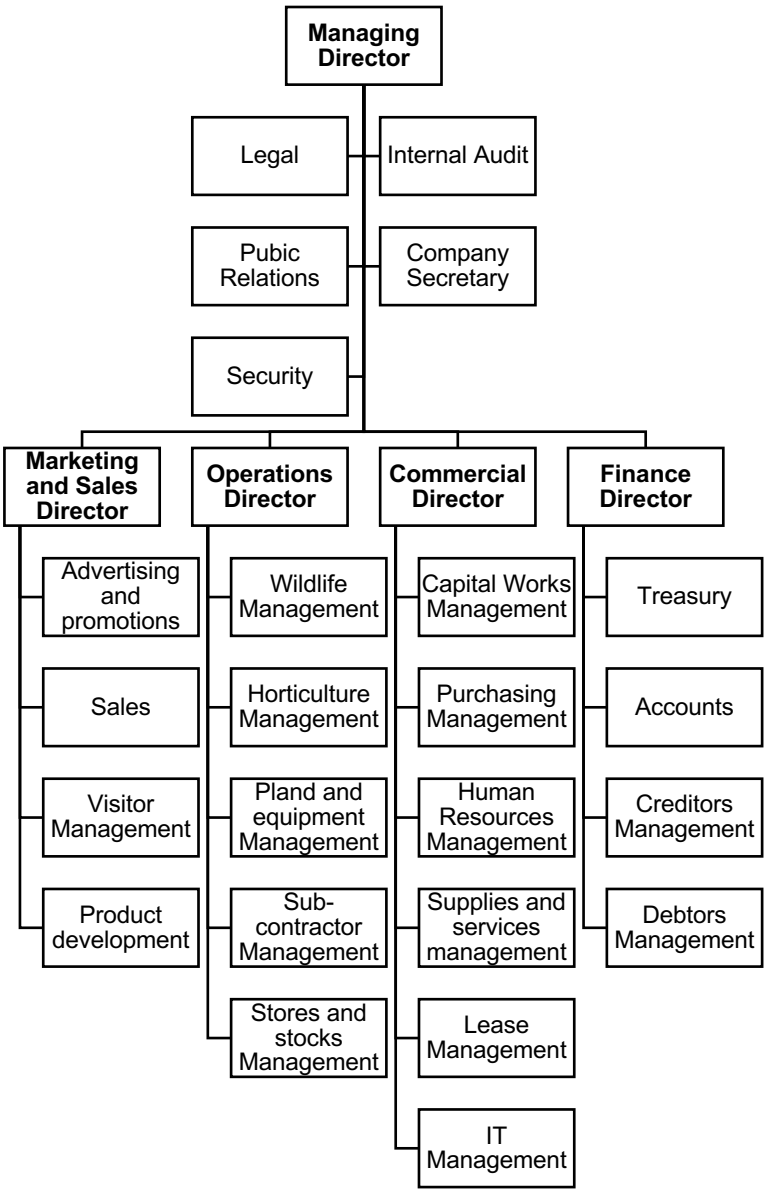

Figure 3: Organisation structure of top and senior management

3 MANAGEMENT AND CONTROL

3.1 Central management functions

High level coordination of the activities of the organisation will be the main purpose of the Management and Control function. It will also be the means through which the organisation interfaces with key external parties such as government departments, advocacy groups and the wider public.

It includes also centralised services such as: the Company Secretary, Internal Audit, Public Relations, Legal and Security.

The organisation structure appears on the figure below:

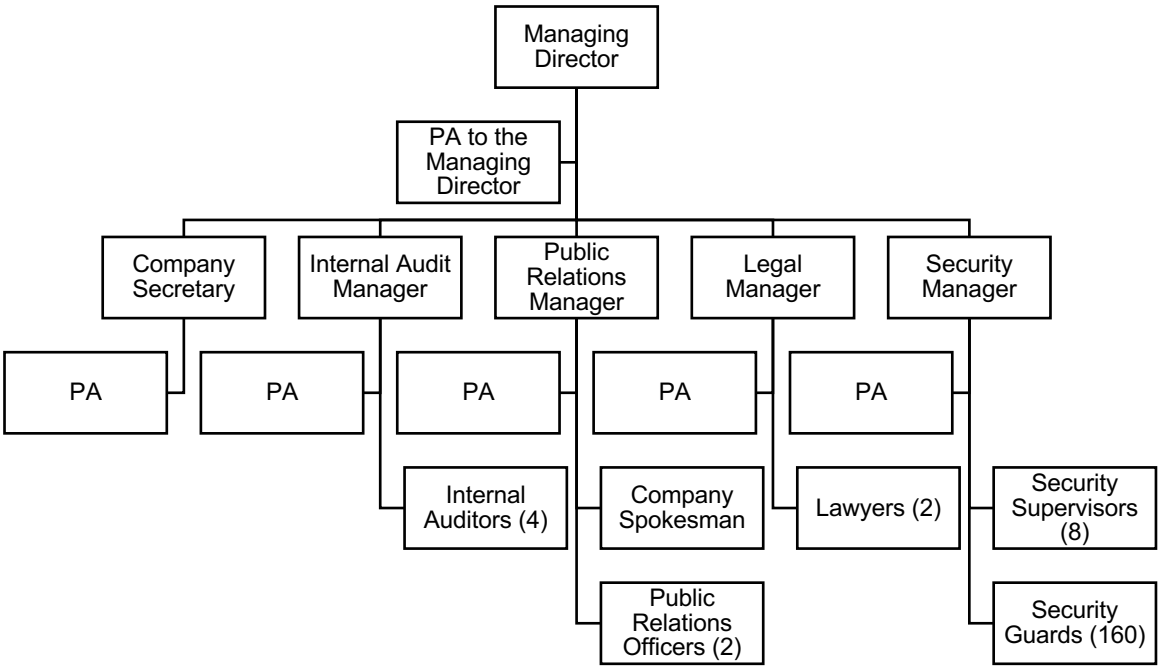

Figure 4: Organisation structure Management and Control

3.2 Staffing and resource requirements

Personnel numbers in the Management and Control function will be as given in the table below.

Band[1]	Occupational Level	Number
F	Top managers	1
E	Senior managers	1
D	Middle managers	4
C	Skilled workers/managers	17
B	Front line supervisors	8
A	General workers	160

Table 1: Staffing of the Management and Control function

Resource requirements would be as given on the next table.

Resource	Unit	Unit quantity	Number	Quantity
Office accommodation[2]	m^2	$25m^2$/person	21	525
Office furniture and equipment	set	item	21	21
Electricity	kWh/month	200kWh/person	21	4200
Water and sewerage	litre/month	1000l/month	21	21000
Patrol vehicles[3]	ea	item	10	10
Uniforms and protective clothing	set	2 sets/year	160	320
Small arms[4]	ea	item	160	160
Perimeter fencing	m	m	30000	30000
Entrance gate/guard house	m^2	m^2	200	200

Table 2: Resource requirements for the Management and Control function

[1] The Patterson job grading system allocates an employee to one of six occupational bands that reflect the scope of decisions taken in the performance of the job. Patterson bands range from A to F. The lowest (A) refers to unskilled workers who relatively simple tasks under close supervision. The highest (F) refers to the Top Management group.

[2] Assume an average of $25m^2$ per person, including passageways, reception areas, filing storage and other service areas.

[3] Assume half the security guards are on mobile patrol (2 guards/vehicle).

[4] Assume all guards are armed.

4 MARKETING AND SALES

4.1 Product concept and products/services offered

The product or, rather, services offered by the project is the wild preservation of animals, with interdependent botanical species, that are threatened with extinction. This, in itself, is the primary reason why charitable foundations and corporate sponsors with environmental protection mandates will support and underwrite the initiative. Public interest in the natural environment is the ultimate motivation for this trend.

Specific products and services that would be offered include:

- Visits by individuals and parties to Noah's Ark, where they can experience the work of safeguarding endangered species first-hand, including the high levels of security needed to protect them
- Opportunities to experience leading technologies that are relevant to the preservation of wildlife, including the world's first eDNA bank for wildlife
- A website providing information about Noah's Ark and soliciting donations from the public, with recognition of support given by charitable foundations and corporate sponsors
- A PR campaign already in planning, for building public awareness to the project, comprising: the release of music singles by celebrity artists, a television series and merchandising to be sold to the networks across the world, a year-on-year concert series to be performed in New York, London and Tanzania, and a musical to be staged initially in London's West End, followed by New York's Broadway and elsewhere.

The Noah's Ark offering will cater mainly for mid- to high-end holiday budgets of foreign visitors, with the possibility of providing for day visitors as well.

4.2 Sales channels and the selling processes

Selling visits to the Park will involve the use of on-line sales channels, the development of strategic partnerships and the use of off-line channels.

On-line sales channels will involve:

- An official website that will carry advertising and promotional material as well as a bookings application for entry to the Park and also accommodation at one of the three hotels
- A listing with Google My Business
- Listing the Park with at least two of the major On-line Travel Agencies (eg. Expedia);
- Selection of at least one of the review networks (eg. Tripadvisor)
- The use of social media (such as Instagram)

Some strategic partners will include:

- Store-front travel agencies and agency groups
- Tour operators; (eg Tui)
- Destination management organisations (eg the Tanzania Tourist Board)

Off-line channels will include:

- Hotels (concierges);
- Trade events; and,

- Visitor information centres.

Marketing collateral will include:

- Brochures placed with travel agencies;
- Articles written for travel and nature magazines and the weekly press;
- Leaflets and flyers placed with hotel concierge desks, restaurants and visitor information centres; and,
- Episodes produced for nature orientated television programmes.

4.3 Competition

Africa has a vast network of both public and private nature reserves catering for tourists and visitors interested in wildlife. Experiences offered cater for a very wide range of budgets. Self-catering camping holidays are available at the low end. At the high end, full-service 5 star guided tours are offered, which in some cases include hunting safaris.

Those reserves, offering their traditional bush-immersion experiences of indigenous animals, some with a handful of foreign animals in pens, are not competitors however. The Noah's Ark experience will be unique and iconic, certainly unlike anything ever attempted before, in that what visitors will see, all in one place, is: a range of species from across the globe, mostly free range in open spaces or effectively so in large climate controlled Eden-Project-like domes, all protected within a Jurassic-Park-like wall with high tech security, and a museum exhibiting the history of wildlife conservation brought alive with hologram projections.

Television channels and web based video sites[5] pay royalties for material of interest to their audiences.

There is lively competition for nature conservation donations from the public, the corporate sector and charitable foundations. Organisations notably active in this area include:

- The World Wildlife Fund[6];
- Greenpeace;
- The African Wildlife Foundation;
- The Nature Conservancy;
- Naturschutzbund Deutschland.

There are, however, many others, often with a specific regional or country focus.

The success of an appeal to the public or to institutional donors will depend on the level at which the name "Noah's Ark" and the unique nature of its work can be positioned in the global public consciousness.

4.4 The visitor market

Tanzania as a whole covers 945,234 square kilometres, some 32.5% of which is protected areas under the management of the Ministry of Natural Resources and Tourism. Key tourist attractions are the opportunity to view wildlife (Ngorogoro/Serengeti) and mountain climbing (Kilimanjaro) in the north, wildlife viewing and nature experiences in the southern circuit, centred on the Selous Reserve and coastal recreational activities and cultural experiences on the islands of Zanzibar, Pemba and Mafia.

[5] Such as Youtube.
[6] Now officially called the World Wide Fund for Nature.

Travel by road between the southern and the northern zones is somewhat challenging (8 hours), but there are aircraft operators who offer daily flights to connect the main tourist sites. However, costs of the internal air travel between Dar as Salaam and the northern areas at about 1,000 USD would be a deterrent for many visitors.

The main point of entry for overseas tourists is Julius Nyerere International Airport (JNIA) which can handle six million passengers per year. International connections are also available from Kilimanjaro International Airport (KIA) and Abeid Amani Karume International Airport (AAKIA) in Zanzibar.

Zanzibar lies off the coast some 83 km to the north Dar as Salaam and covers 2,400 square kilometres. Transport connections are by ferry (about 2 hours journey time) and by air (about 1 hour travel time). The airport has seasonal intercontinental connections to Paris, Milan, Amsterdam and Frankfurt, and year-round flights to Rome, Zurich Dubai, Muscat, Doha and Istanbul.

Information on the tourist sector is published in annual reports under a joint initiative by the Ministry of Natural Resources, the Bank of Tanzania, the National Bureau of Statistics, the Immigration Services Department and the Zanzibar Commission for Tourism. These contain survey data for the country as a whole and for Zanzibar separately for the years 2004 to 2019. Further information on records of arrivals for the years (1995 to 2019) is available from the World Bank: “International Tourism: Number of Arrivals”.

Figure 5 shows the record of total annual tourist arrivals during 1995 to 2019. The exponential growth rate during that period was 6.12% per annum. The corresponding growth in the global market was 3.6% per annum. To explain the difference, Tanzania’s international tourism is a relatively recent development.

Calculation of the logistic curve, shown as a dashed line on the graph, is based on a ceiling of 2 million visitors in 1980 which increases annually at the world industry growth rate thereafter. A further assumption made is that the Tanzanian market will achieve half of its potential share of the global market in 2060. A logistic scale parameter set at 0.035 produced a satisfactory fit to the data.

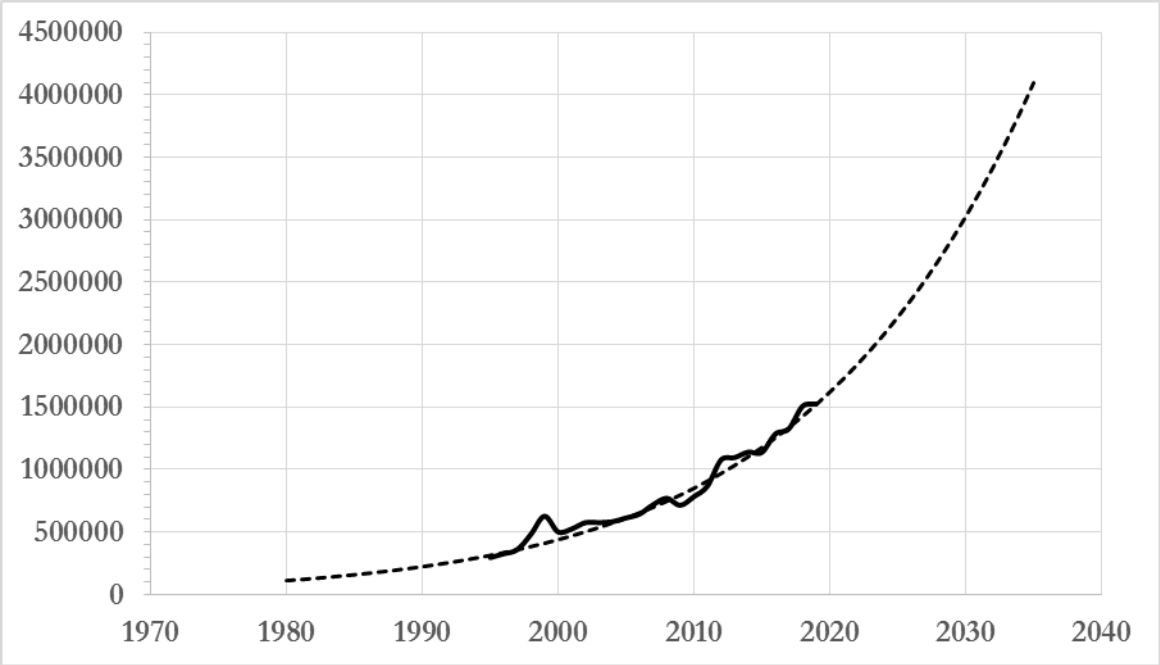

Figure 5: Forecast of tourist arrivals using a logistic function

The forecast of arrivals for the period 2026 to 2045 is given on Table 3.

Year	Number (millions)		Year	Number (millions)
2026	2.2		2036	4.3
2027	2.5		2037	4.6
2028	2.7		2038	4.9
2029	2.8		2039	5.2
2030	3.0		2040	5.5
2031	3.2		2041	5.8
2032	3.4		2042	6.2
2033	3.6		2043	6.6
2034	3.9		2044	6.9
2035	4.1		2045	7.4

Table 3: Forecast of total tourist arrivals

Total arrivals include all visitors. Some information on the proportion among these of holiday makers and leisure visitors is to be found in the annual Tourism Sector Survey Reports, posted on the Bank of Tanzania website. Table 4 below gives the percentages, gathered via exit questionnaires for the years 2004 through to 2019.

Year	Percent		Year	Percent
2004	90.0		2012	81.0
2005	88.0		2013	71.4
2006	*85.8*		2014	69.1
2007	83.6		2015	65.0
2008	62.4		2016	59.9
2009	79.1		2017	62.9
2010	81.1		2018	62.6
2011	80.0		2019	67.0

Table 4: Percentage holiday and leisure tourists (the figure for 2006 is an interpolation of missing data)

Some caution is warranted in using this data. It refers to statistics gathered over a relatively short period in each year and may be subject to cyclical effects and may not necessarily accurately represent the results for each year as a whole. For the purposes of projecting the numbers of holiday and leisure tourists a figure of 60% was chosen as a conservative assumption.

This produces the forecast shown on Figure 6 and set out in Table 5.

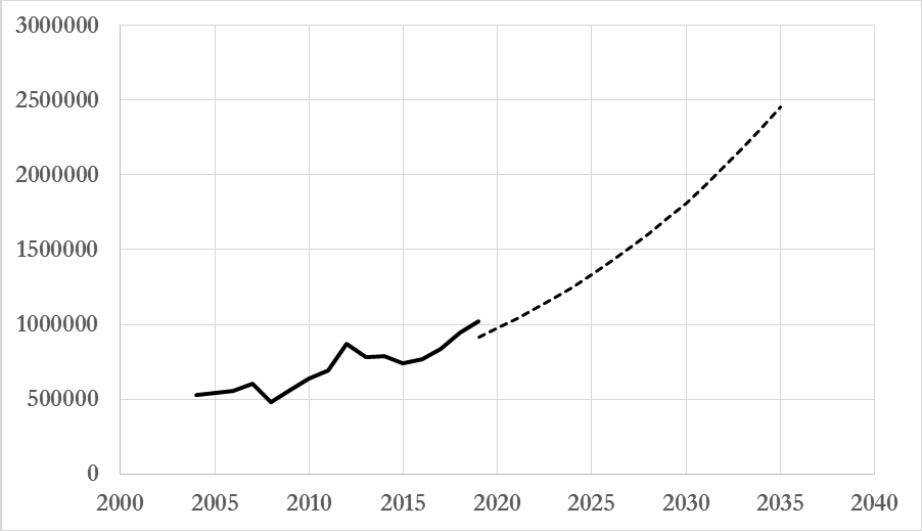

Figure 6: Projection of holiday and leisure tourists to Tanzania

Year	Number (millions)		Year	Number (millions)
2026	1.4		2036	2.6
2027	1.5		2037	2.8
2028	1.6		2038	2.9
2029	1.7		2039	3.1
2030	1.8		2040	3.3
2031	1.9		2041	3.5
2032	2.0		2042	3.7
2033	2.2		2043	3.9
2034	2.3		2044	4.2
2035	2.5		2045	4.4

Table 5: Forecast of holiday and leisure tourists

Records of travellers departing from the main airports in Tanzania are available from the annual tourist survey reports. Percentages are given on Table 6. The data given refers to percentages from all points of departure. This has been normalised on the right hand side of the table to reflect the main airports used by intercontinental travellers.

Year	AAKIA	JNIA	KIA	AAKIA	JNIA	KIA
	All departure points			Normalised for main ports		
2004	14.3	37.6	24.9	18.6	49.0	32.4
2005	n/a	n/a	n/a			
2006	n/a	n/a	n/a			
2007	n/a	n/a	n/a			
2008	26.3	46.3	12.7	30.8	54.3	14.9
2009	30.5	30.8	18.4	38.3	38.6	23.1
2010	40.1	17.6	21.2	50.8	22.3	26.9
2011	25.2	37.6	16.3	31.9	47.5	20.6
2012	23.9	34.3	26.1	28.4	40.7	31.0
2013	25.2	34.8	20.4	31.3	43.3	25.4
2014	23.1	36.8	17.9	29.7	47.3	23.0
2015	25.5	41.1	11.1	32.8	52.9	14.3
2016	20.3	40.6	14.2	27.0	54.1	18.9
2017	19.9	46.1	12.7	25.3	58.6	16.1
2018	26.2	47.5	9.2	31.6	57.3	11.1

Table 6: Percentage use of main departure points

Averages for the period 2008 to 2018 are:

AAKIA (Zanzibar)	32.5%
JNIA (Dar as Salaam)	47.0%
KIA (Arusha)	20.5%

The probability that a visitor departing from any one of these airports would visit Noah's Ark would differ. It would be safe to assume that most of those visiting Zanzibar would also visit the site and that a high percentage of those visiting other attractions in the south would also take advantage of this opportunity, but that only a small number of those visiting the north and using Kilimanjaro International would be part of the market. There is no data available on which to base a calculation of these probabilities and, therefore, assumptions, based on nothing other than judgement have been used. Assumptions made to calculate a forecast are that those using AAKIA would visit Noah's Ark with a probability of 0.95. The corresponding assumptions for those using JNIA and KIA would be 0.5 and 0.1 respectively. These yield the following forecast of numbers (in millions) visiting the site.

Year	Via Zanzibar	Via Dar as Salaam	Via Kiliminjaro	Total
2026	0.44	0.33	0.03	0.80
2027	0.47	0.35	0.03	0.85
2028	0.50	0.38	0.03	0.91
2029	0.53	0.40	0.03	0.96
2030	0.56	0.43	0.04	1.02
2031	0.60	0.45	0.04	1.09
2032	0.63	0.48	0.04	1.16
2033	0.67	0.51	0.04	1.23
2034	0.72	0.54	0.05	1.31
2035	0.76	0.58	0.05	1.39
2036	0.81	0.61	0.05	1.47
2037	0.86	0.65	0.06	1.56
2038	0.91	0.69	0.06	1.66
2039	0.96	0.73	0.06	1.76
2040	1.02	0.78	0.07	1.87
2041	1.08	0.82	0.07	1.98
2042	1.15	0.87	0.08	2.10
2043	1.22	0.92	0.08	2.22
2044	1.29	0.98	0.09	2.35
2045	1.36	1.04	0.09	2.49
2026	0.44	0.33	0.03	0.80
2027	0.47	0.35	0.03	0.85
2028	0.50	0.38	0.03	0.91
2029	0.53	0.40	0.03	0.96
2030	0.56	0.43	0.04	1.02
2031	0.60	0.45	0.04	1.09
2032	0.63	0.48	0.04	1.16
2033	0.67	0.51	0.04	1.23
2034	0.72	0.54	0.05	1.31

Table 7: Forecast of visitors to Noah's Ark – Zanzibar (millions per year)

4.5 Visitor pricing

The proportion taking advantage of the availability of package tours and the daily levels of expenditures indicate that leisure and wildlife tourists to Tanzania belong to a relatively high socio-economic grouping. This suggests that entrance fees pitched at a price point within the range of theme park tickets prevailing in Europe and the United States would be acceptable to most visitors.

Some current (2023) theme park entrance ticket prices in USD are given on Table 8.

Attraction	Ticket (USD)
Universal Studios Hollywood	199.00
Busch Gardens Tampa	117.89
EPCOT Center	120.00
Kennedy Space Center	80.25
Eiffel tower	96.82
Machu Picchu	90.00
Grand Canyon	53.17
Disneyland Paris	60.92
Kruger National Park Safari	96.04

Table 8: Theme park ticket prices (Source: Viator)

It seems reasonable, therefore, to assume that an entrance fee of 120USD would be in line with the expectations of the market.

4.6 Revenue projections

Assuming a rate of inflation of the US dollar of 3.7% per annum, the projected revenues from entrance fees would be as given in Table 9 for Zanzibar and Tanzania together, and roughly a third of that for Zanzibar alone, assuming that substantial completion of the project would be achieved in 2027.

Year	Revenue (USDm)
2027	109.8
2028	121.2
2029	133.6
2030	147.3
2031	162.4
2032	179.0
2033	197.2
2034	217.2
2035	239.2
2036	263.4

Table 9: Revenue projections

4.7 Accommodation requirements

The number of hotels required in each category was calculated on the assumptions that: 5, 4 and 3 star hotels would each contain 200, 350 and 450 rooms respectively; that room occupancy rates would be 65% on an annual basis; and, that tourists via Zanzibar would use park hotels for 0.25 nights on average. Those via Dar as Salaam would need accommodation for 0.5 nights and those via Arusha would need accommodation for 1.0 nights on average. The table below gives the resulting number of hotels required.

It is further assumed that the rate of use by hotel standard would follow the same proportions as prevail in South Africa. These are 0.18, 0.36 and 0.46 for 5, 4 and 3 star accommodation respectively.

Year	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
5 star			2	2	2	2	2	2	2	2	3
4 star			2	2	2	2	2	2	3	3	3
3 star			2	2	2	2	2	2	3	3	3
Total			**6**	**6**	**6**	**6**	**6**	**6**	**8**	**8**	**9**

Table10: Projected number of hotels

The Noah's Ark project has three alternatives with regard to the provision of hotel accommodation and catering services at the park:

1. All hotels, restaurants and food court outlets could be owned and operated by the organisation itself;
2. All hotel and other buildings could be owned by the project and leased to hotel, restaurant and other catering operators;
3. The land occupied by hotels, food and retail outlets could either be sold or leased on a long term basis to one or more property developers who would then provide whatever accommodation would be needed by the hospitality and retail sectors on the site.

The first would introduce a significant level of complication to the management of the scheme by involving the organisation in five separate industries: park management, property development, property management, hotel services and catering services.

The second is exposed to much the same risks and problems as the first and, without a compelling reason for needing to manage all the structures on the site, has no practical advantage over the third.

It is worth noting that all net revenues from hospitality industry operations would be fully taxable at the rate prevailing in Tanzania. The third alternative has the advantage that the disposal of land to developers at the beginning of the project could be classified as a capital gain and taxed at a lower rate. The proceeds could be used as part financing the project.

Prices currently[7] asked for land in locations suitable for high-end hotels and restaurants are around $6.7 million per hectare[8]. A similar figure would apply to buildings used for food courts and retail outlets.

Revenues from land sales (inflated at an annual rate of 3.7%) were projected on the assumption that each hotel would require 3 hectares of land and that additional hotels would be built as needed to accommodate the projected number of visitors. It was also assumed that the building housing food courts and retail outlets would require the same area as that needed for a hotel. The results are given on the table below.

Year	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Hotels			129.8								
Food court			21.6								
Total			**151.4**								

Table 11: Projected revenues from land sales ($m). The total for Zanzibar alone is $47.3m

Additional revenues would be derived from product merchandising, music, video and book sales that will be associated with the promotion of the project. The most important of these will be the sales of Noah's Ark dog-tags at multiple retail checkout points on a worldwide basis. Sales projections are given on Table 12.

[7] October 2022.
[8] Deduced from a survey of leading estate agents' websites.

Year	Unit	-2	-1	0	1	2	3	4	5	6	7	8
Dog-tags	million	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Music singles	thousand	50	50	50	50	50	50	50	50	50	50	50
Music videos	m. views	40	40	40	40	40	40	40	40	40	40	40
Books	thousand	70	70	70	70	70	70	70	70	70	70	70

Table 12: Projected merchandise sales volumes

Net revenues at prices typically associated with these items would imply the figures as shown with overall revenue figures in the next table. Brand licensing will be an important source of income, from a limited number of major commercial organisations, most likely at least three, who wish to position themselves favourably as supporters of environmental issues.

Year	-2	-1	0	1	2	3	4	5	6	7	8
REVENUES											
Visitor entrance ticket sales			109.8	121.2	133.6	147.3	162.4	179.0	197.2	217.2	239.2
TV Distribution sales		30.0	32.3	36.0	41.6	49.9	62.0	80.0	107.0	148.4	213.4
Merchandising sales											
Dog-tags	9.8	10.1	10.5	10.9	11.3	11.7	12.2	12.6	13.1	13.6	14.1
Music singles		1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.7
Music videos		0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2
Books	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Brand licensing			54.1	112.1	174.4	180.9	187.6	194.5	201.7	209.2	216.9
Park Sponsors	0.6	0.6	0.7	0.7	0.9	1.0	1.3	1.7	2.2	3.1	4.4
Total – TZA + ZNZ	10.8	43.3	210.0	283.7	364.7	393.8	428.5	470.9	524.5	594.8	691.5
Total – ZNZ alone	10.5	43.0	134.1	200.0	272.4	/292.0	316.2	347.1	387.8	443.9	524.9

Table 13: Projected merchandise net sales revenues ($m) TZA + ZNZ, or ZNZ alone

4.8 Marketing and Sales staffing

The Marketing and Sales function, in addition to the management of selling channels and the selling process, includes all activities associated with giving every visitor a rewarding experience when visiting the Noah's Ark nature reserve. This means that any staff member who has any contact with visitors is part of the Marketing and Sales function. The staff structure is shown on the figure below.

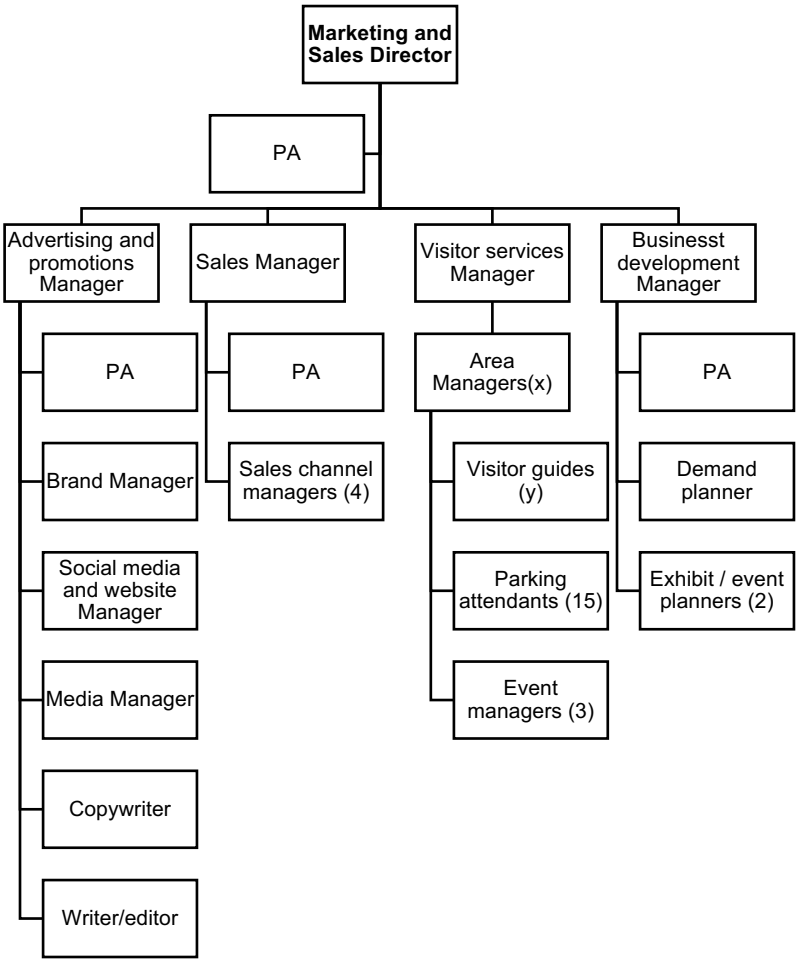

Figure 7: Marketing and Sales organisation chart

The number of Area Managers (x in the chart above) will depend on the number of exhibits (domes, the museum, etc.) existing on the site as the development of the project evolves. The number of Visitor Guides needed (y) will depend on the growth in the annual number of visitors to the site. An estimate, based on the experience of Disney Parks[9], suggests that each Visitor Guide will be able to serve 6000 visitors on an annual basis.

4.9 Staffing and resource requirements

The projected evolution in personnel numbers in the Marketing and Sales function will be as given on the table below.

Band	Year	-2	-1	0	1	2	3	4	5	6	7	8
F	Top managers		1	1	1	1	1	1	1	1	1	1
E	Senior managers			4	4	4	4	4	4	4	4	4
D	Middle managers			5	6	7	8	10	11	12	13	14
C	Skilled/ lower managers			13	13	13	13	13	13	13	13	13
B	Front line supervisors			9	18	37	66	96	116	126	131	134
A	General workers			15	15	15	15	15	15	15	15	15

Table14: Staffing of the Marketing and Sales function

[9] See Brooks Barnes article in New York Times, 25 April 2015.

Assumptions on Marketing and Sales resource requirements are as given on the next table.

Resource	Unit	Unit quantity	Notes/assumptions
Office accommodation	m^2	$25m^2$/person	Per office worker
Office furniture and equipment	set	item	Per office worker
Telecommunications	fixed charge	item	1 adsl line and 5 telkom lines
Electricity	kWh/month	200kWh/person	
Water and sewerage	litre/month	1000l/month	
Vehicles	ea	item	15 A + B band personnel per minibus
Uniforms	set	2 sets/year	
Advertising production	Advertisement	item	12 campaigns per year
Paid media	Placing	item	120 placings per year
Promotional items	Range	set	120 sets per visitor guide
Printing	Page	pages	10 000 pages per year
Signage	Sign	item	100 renewals per year
Vehicle parking area	ha	$36m^2$/500 visitors	

Table 15: Assumptions on Marketing and Sales resource requirements

Projections of these requirements are given on the table below.

Year	-2	-1	0	1	2	3	4	5	6	7	8
Office accommodation		25	575	600	625	650	700	725	750	775	800
Office furniture & equip.		1	23	24	25	26	28	29	30	31	32
Telecoms (Telkom)		1	1	1	1	1	1	1	1	1	1
Electricity (MWh)		7.2	112.8	136.8	184.8	256.8	333.6	384	410.4	424.8	434.4
Water and sewerage (Ml)		36	564	684	924	1284	1668	1920	2052	2124	2172
Vehicles		0	1	2	3	5	7	8	9	9	9
Uniforms		4	48	66	104	162	222	262	282	292	298
Advertising production		12	12	12	12	12	12	12	12	12	12
Paid media (placings)		120	120	120	120	120	120	120	120	120	120
Promotional items		240	1080	2160	4440	7920	11520	13920	15120	15720	16080
Printing		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Signage		100	100	100	100	100	100	100	100	100	100
Vehicle parking areas		1	1	1	2	3	4	5	6	6	6

Table 16: Projected resource requirements for Marketing and Sales function

5 OPERATIONS

5.1 Scope of operations activities

The scope of park operations will cover:

- Management of all the wildlife kept in the domes and in the open areas;
- Management of the horticultural assets on the site; and,
- The operation and maintenance of all structures, plant and machinery. This will include operation of the museum and provision of basic services on the site.

5.2 Wildlife management

The Noah's Ark proposition is based on the preservation of endangered species. The first task in fulfilling this a system of monitoring animal populations and planning the process for maintaining numbers at desired levels in each case. This will involve the acquisition of animals from elsewhere, breeding programs and the eventual transfer of surplus animals to their natural habitats. It will also involve the design and maintenance of both the botanical and the biological environments within which the animals are to be kept. The objective will be to reproduce, as closely as possible, the natural habitats of the animals.

Supporting this within enclosed domes will involve a number of ancillary tasks, such as: veterinary services, animal feeding (both carnivores and ruminants), cleaning and waste removal.

5.3 Horticulture management

Nature preservation includes the preservation of botanical species. This is over and above the requirements of the park to recreate the natural environments within which the various species to be preserved on the site exist in nature.

Also, the visitor experience will require a physical environment in keeping with the Noah's Ark theme. This means that extensive plantings will be needed in most external areas, with special attention being given to endangered trees and plants.

This also implies that a general garden maintenance service will be provided.

5.4 Wildlife Steering Group

Plans include forming the world's first specialist body for the classification of wild vertebrates, focussing on endangered species, and their interdependence with other plant and animal species. That group will partner with leading botanical entities, notably Kew Gardens, internationally and in Tanzania as well as zoological entities, and will head up the selection, acquisition, upkeep and ultimate rewilded repatriation of all animals in the project.

5.5 Park management

Services at the park - falling under the heading of Facilities Management - will include:

- Visitor transport between various points of interest;
- Operation of the technology within the museum;
- Operation of the heating, ventilation and air conditioning systems within all Noah's Ark buildings and structures (including the domes) on the site; and,
- Provision of electricity, water, waste removal and sanitation services throughout the property.

Another essential service is the cleaning of the grounds on a daily basis. This involves sweeping and cleaning all roadways and pedestrian areas; cleaning all vehicles used for the transport of visitors, all buildings and equipment; and, removing and disposing of all solid waste material.

The large number of structures involved in the project and their associated mechanical and electrical systems will require a continuous maintenance program. This activity will, logically, be divided into two separate disciplines: mechanical and electrical engineering; and civil and structural engineering.

5.6 Operations management and staff

The organisation structure of the Operations function at the park is given in the figure below.

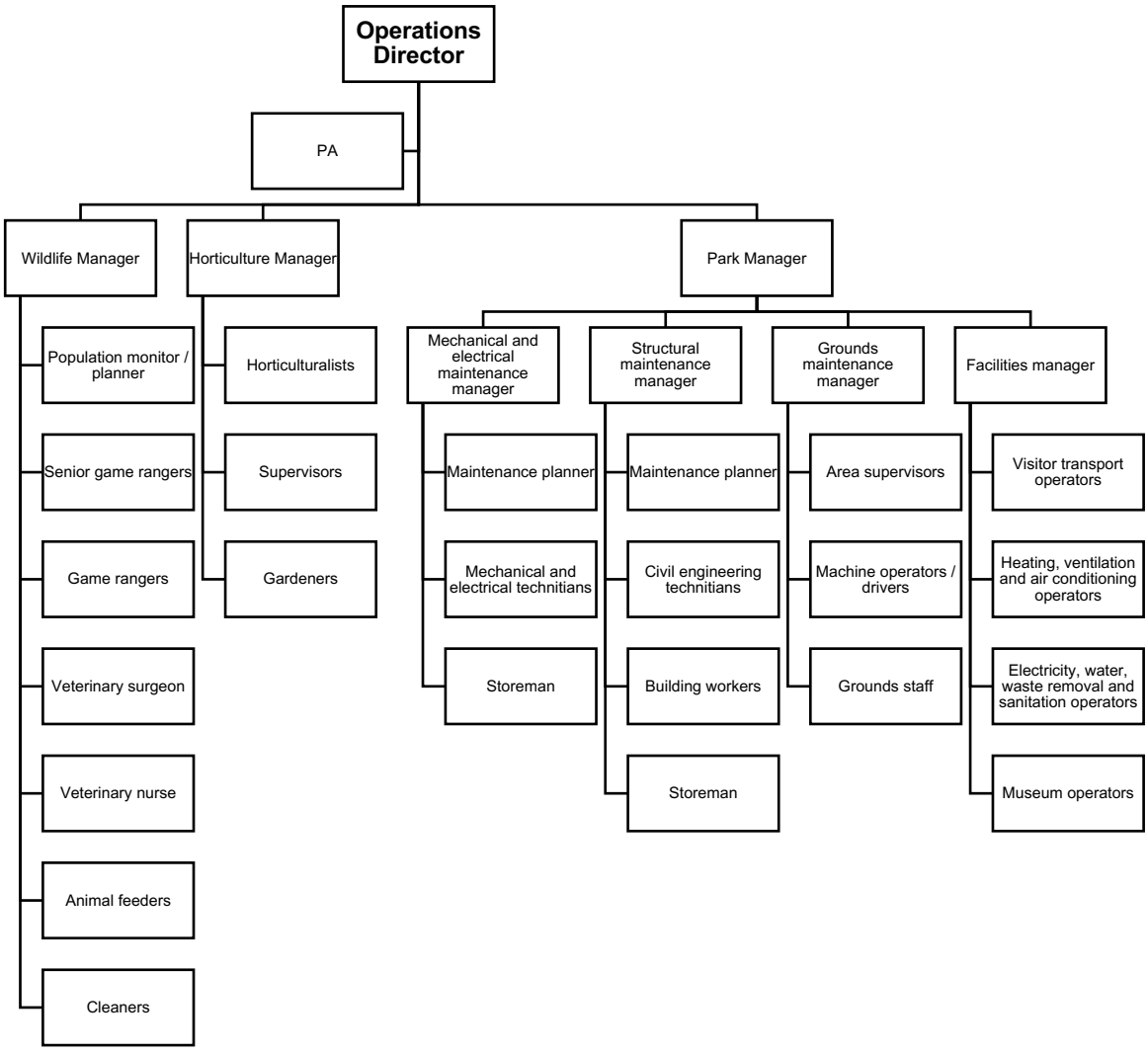

Figure8: Operations organisation chart

5.7 Staffing and resource requirements

Particular assumptions made with respect to the evolution of staffing requirements are as shown below.

Position	Band	Notes/assumptions
Senior game ranger	D	1 per dome
Game ranger	C	2 per dome
Animal feeder	A	2 per dome
Cleaner (Domes)	A	5 per dome
Gardener	A	1 per ha
Garden supervisor	B	1 per every 10 gardeners
Groundsman	A	1 per 30000 visitors

Table 17: Assumptions on Operations human resource requirements

The resulting projection of personnel numbers, by Patterson Band category, would be as given in the table below.

Band	Year	-2	-1	0	1	2	3	4	5	6	7	8
F	**Top managers**	1	1	1	1	1	1	1	1	1	1	1
E	**Senior managers**		3	3	3	3	3	3	3	3	3	3
D	**Middle managers**	2	2	7	8	9	10	11	12	13	14	15
C	**Skilled/ lower managers**			14	18	22	26	30	34	38	42	46
B	**Front line supervisors**			33	33	33	33	33	33	33	33	33
A	**General workers**			85	90	95	100	105	110	115	120	125

Table 18: Staffing of the Operations function

A notable contribution to the operating costs of the project will be the energy requirements associated with climate control within the domes. In the case of those that replicate tropical environments the problem could probably be solved by exploiting solar gain via the transparent dome cladding and natural ventilation. However, where temperatures have to be reduced to reflect arctic and, even, temperate climates special measures will have to be taken. Here the temperature drop between the external atmosphere and the interior of a dome might be anything between 10°C and 35°C. The most appropriate technology in this case will be that used in modern deep-mine cooling and ventilation systems. The approach here will be to install plate ice making plants together with slurry pumps and ice-pipe networks to convey the slush to the points within the domes where cooling is required.

The power required depends on the temperature drop needed, the volume of air within a dome and the rate at which air circulates through the dome. Calculations[10] of the total heat to be removed, assuming: an air change of twice a day, a temperature difference of 10°C, a 70% humidity level and a mechanical efficiency of 50% show that a large dome will require a 5.5MW cooling system and a small dome a 0.7MW system.

The capital cost will be around $560/kW installed[11]. Thus, supposing that one of the large domes and two small domes needed to be cooled by 10°C, and one of the small domes needed to be cooled by 35°C, the unit costs of these systems will be $3.07m, $0.39m each and $0.61m, respectively.

[10] The cooling load of a dome is given by the equation: $h_s + h_l = c_p \rho q dt + \rho h_{we} dw_{kg}$ where c_p is the specific heat of air (1.0006 kJ/kg°C), ρ is the density of air (1.202 kg/m^3), q is the air volume flow (m/s), dt is the temperature difference (°C), h_{we} is the latent heat of evaporation of water in air (≈2453kJ/kg) and dw_{kg} is the humidity ratio (kg water / kg air).

[11] Dr Gareth Evans in Mining Technology – Global Data, "Ice cooling takes the heat off Harmony's Phakisa gold mine" Feb 2015

At an 80% load factor their corresponding annual energy consumption rates will be: 60330MWh, 7540MWh and 11810MWh.

Assumptions made for the projections of other resource requirements of the Operations function are summarised in the following table.

Resource	Unit	Unit quantity	Notes
Land	ha	1000	Initial working assumption
Office accommodation	m^2	24	Gross area per person[12]
Office furniture and equipment	set	1	Desk, chair, desktop computer, use of printer
Telecommunications	Item	1	ADSL line, server and ISP service
Electricity	kWh	200/m^2	Annual consumption per m^2 [13]
Staff transport (mini-buses)	no.	1/15	One vehicle for every 15 A and B staff members[14]
Distribution sub-station	Item	88kV/11kV	Assume 88kV primary infeed
Distribution lines	m	11kV	Assume 11kv distribution voltage
Distribution sub-stations	Item	11kV/380V	One sub-station for each major site

Table 19: Assumptions made for Operations resource requirements

These, together with the assumptions previously mentioned, imply projected resource requirements as given on the next table.

[12] See Government Gazette Sep. 2005 No. 27985. SPACE PLANNING NORMS AND STANDARDS FOR OFFICE ACCOMMODATION USED BY ORGANS OF STATE.
[13] See GBCSA Energy & water benchmark methodology – final report Nov 2012
[14] Based on carrying capacity of mini-buses.

	Year	-1	-2	0	1	2	3	4	5	6	7	8
Resource	**Unit**											
Land	ha	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Office accommodation	m^2	72	144	600	720	840	960	1080	1200	1320	1440	1560
Furniture & equipment	set	3	6	25	30	35	40	45	50	55	60	65
Telecommunications	Item	1	1	1	1	1	1	1	1	1	1	1
Water and sewerage	kl	36	72	1716	1836	1956	2076	2196	2316	2436	2556	2676
Uniforms	set			236	246	256	266	276	286	296	306	316
Veterinary clinic	m^2			300	300	300	300	300	300	300	300	300
Veterinary equipment	set			1	1	1	1	1	1	1	1	1
Greenhouse / yard	m^2			5000	5000	5000	5000	5000	5000	5000	5000	5000
Mech. & elec. workshop	m^2			300	300	300	300	300	300	300	300	300
M & E mach. & equip.	set			1	1	1	1	1	1	1	1	1
M & E store	m^2			300	300	300	300	300	300	300	300	300
Builder's yard / store	m^2			2000	2000	2000	2000	2000	2000	2000	2000	2000
Museum control room	m^2			100	100	100	100	100	100	100	100	100
Museum control equip.	set			1	1	1	1	1	1	1	1	1
Facilities control room	m^2			200	200	200	200	200	200	200	200	200
Facilities control equip.	set			1	1	1	1	1	1	1	1	1
Distribution sub-station	Item	1	1	1	1	1	1	1	1	1	1	1
Distribution lines	km	10	10	10	10	10	10	10	10	10	10	10
Reticulation sub-stations	Item			3	4	5	6	8	9	10	11	12
Reticulation lines	km	5	5	5	5	5	5	5	5	5	5	5
Electricity consumption	GWh	1	1	43	83	122	253	265	290	323	348	358
Peak power demand	MW			6	12	17	30	32	34	38	41	42
Water tower	Item			1	1	1	1	1	1	1	1	1
Pump-house	Item			1	1	1	1	1	1	1	1	1
Water supply lines	km			20	20	20	20	20	20	20	20	20
Sewerage lines	km			20	20	20	20	20	20	20	20	20
Sewage treatment plant	Item			1	1	1	1	1	1	1	1	1
Cooling plant - large dome	Item						1	1	1	1	1	1
Cooling plant - small dome	Item							1	1	1	2	2
Cooling plant – cold dome	Item								1	1	1	1
Overhead rail structure	km			5	5	5	5	5	5	5	5	5
Rail stations	Item			4	4	4	4	4	4	4	4	4
Vehicles (minibuses)	Item			8	9	9	9	10	10	10	11	11
Vehicles (3 ton trucks)	Item			5	5	5	5	5	5	5	5	5
Vehicles (Refuse removal)	Item			3	3	3	3	3	3	3	3	3
Vehicles (visitor cars)	Item			2	2	2	2	2	2	2	2	2
Vehicles (O/H rail sets)	Item			4	9	21	38	56	68	74	77	79

Table 20: Projected resource requirements for the Operations function

6 COMMERCIAL

6.1 Scope of Commercial activities

The most useful approach to planning the Commercial function is to classify the activities under the headings of Capital Works, Human Resources and Supplies and Services. Each case will involve the identification of sources, of the resources needed, a resource acquisition strategy and the unit costs or prices that will need to be paid.

This section begins with the organisation of the Commercial function and then deals with the estimated costs of each of the key resources required for the implementation and continued operation of the project.

6.2 Capital Works management

The most efficient way of organising a major capital works program is to appoint a Capital Works manager to oversee all the structures and facilities to be installed on-site and a leading Project Management consultancy to manage all design and build contracts for the project. This will include:

- The domes,
- All buildings,
- The control centre,
- The IT centre,
- The parking area,
- Roads and paving,
- Perimeter fencing,
- Landscaping,
- Etc.

The Project Management consultancy is to be engaged at the onset, to oversee all aspects through the life of the project, to its final stage of commissioning.

While the Noah's Ark capital works program could continue indefinitely, the intensity of activities would peak during the initial period and then taper off gradually after commissioning of the project. It would make sense, therefore, to adopt the strategy of using Engineering, Procurement and Construction Management contractors for all major works.

6.3 Human resources management

Essential functions of the Human Resources department will be: personnel recruitment, payroll management and safeguarding the health and safety of all staff.

This requires staff with expertise in:

- Labour related legislation,
- Recruitment processes and procedures,
- Record keeping, and
- First aid and the treatment of minor injuries and illnesses.

6.4 Supplies and services acquisition

The acquisition of supplies and services involves the purchasing, under contract, of all supplies and services required by Noah's Ark including all of the wildlife and botanical specimens acquired by the project. This will include negotiating with government authorities to obtain all necessary permits and permissions required, the identification of specialist contractors and the management of contractual arrangements and logistical processes.

It will also involve the preparation of purchasing contracts, issuing tenders and requests for proposals, contract negotiation and the storage and safekeeping of all stores and materials on the site. It will also include verification of all supplies and services delivered and issuing parts and materials to Marketing and Sales, Operations and Financial functions of the organisation.

6.5 IT services

IT and communications services will be provided by a central IT department which will be responsible for the maintenance and good operation of all computer services as well as all IT aspects of control and instrumentation throughout the site.

6.6 Commercial management and staff

This leads to the proposed organisation structure shown in the figure below.

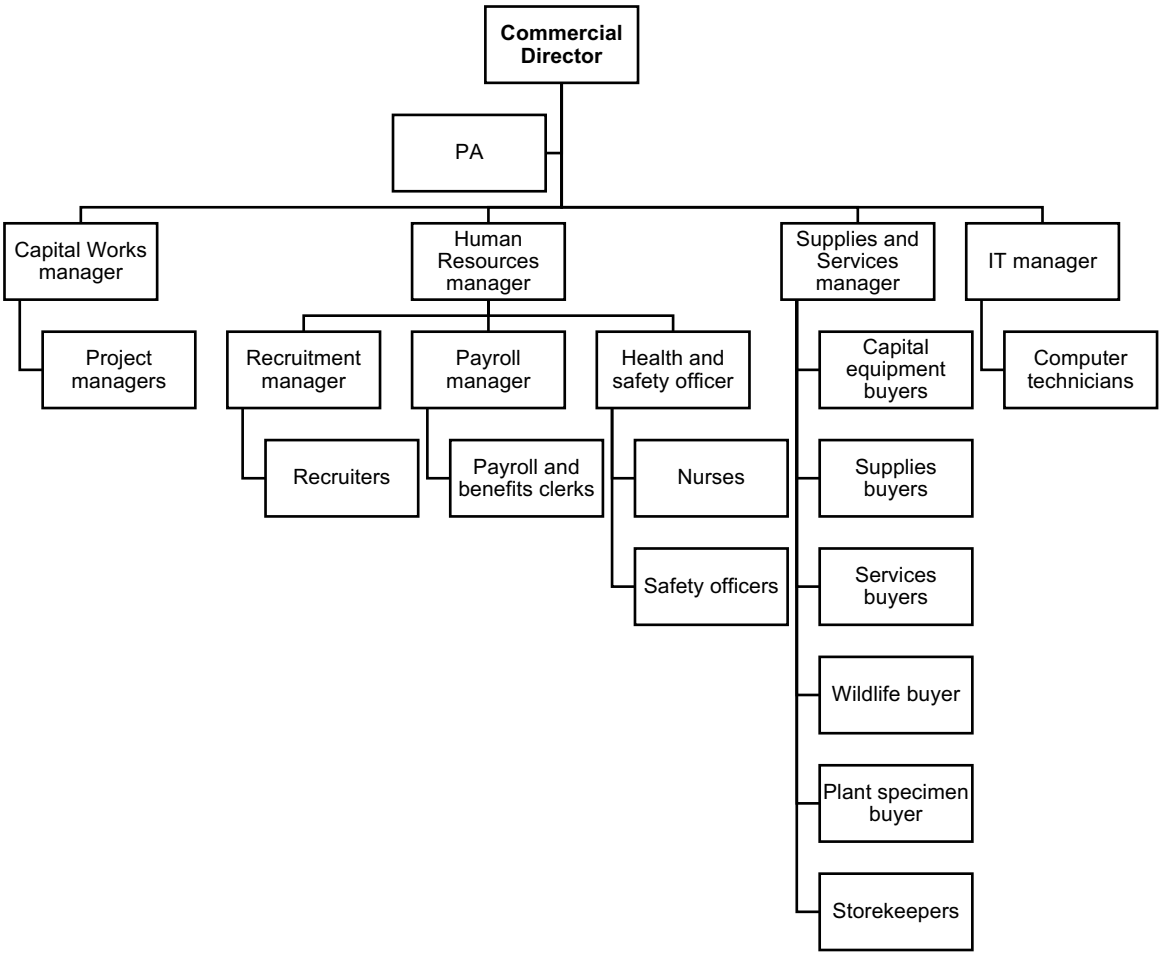

Figure 9: Commercial function organisation chart

The staffing requirements for the Commercial function are summarised on the table below.

Band	Year	-2	-1	0	1	2	3	4	5	6	7	8
F	Top managers	1	1	1	1	1	1	1	1	1	1	1
E	Senior managers	3	3	4	4	4	4	4	4	4	4	4
D	Middle managers	10	10	13	12	11	10	9	8	7	6	5
C	Skilled/ lower managers	30	30	30	30	30	30	30	30	30	30	30
B	Front line supervisors			5	5	5	5	5	5	5	5	5

Table 21: Staffing of the Commercial function

6.7 Resource requirements

Estimated resource requirements are given on the table below

	Year	-1	-2	0	1	2	3	4	5	6	7	8
Resource	**Unit**											
Office accommodation	m^2	1056	1056	1272	1248	1224	1200	1176	1152	1128	1104	1080
Furniture & equipment	set	44	44	53	52	51	50	49	48	47	46	45
Telecommunications	Item	1										
Water and sewerage	kl	528	528	636	624	612	600	588	576	564	552	540
Electricity consumption	GWh	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Warehouse	m^2	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Computer servers	item	5	5	5	5	5	5	5	5	5	5	5
Computer room	m^2	200	200	200	200	200	200	200	200	200	200	200
Clinic	m^2	200	200	200	200	200	200	200	200	200	200	200
Clinical equipment	item	1	1	1	1	1	1	1	1	1	1	1
Vehicles (ambulance)	Item	1	1	1	1	1	1	1	1	1	1	1
		5	5	5	5	5	5	5	5	5	5	5

Table 22: Resource requirements of the Commercial function

6.8 Land

The government of Zanzibar is ready to provide lands FOC on terms to be agreed, as soon as funds are secured. The government of Tanzania is expected to follow suit.

6.9 Capital works

Unit costs for major works, at this stage of the Feasibility Study, are necessarily based on whatever experience is accessible on similar works.

The most important of these are the domes. To date the largest dome ever built was the Miyazaki dome in Japan with a diameter of 316.5 m, but with a retractable roof (since demolished). Other very large domes include the Singapore National Stadium at 310m, and the Fukuoda and the Nagoya domes in Japan at 216m and 187m respectively (again, all with retractable roofs).

These examples would suggest that the maximum clear span of the Noah's Ark domes should probably be set at 300m with an overall height of 80m. Exceeding this could result in, as yet unknown, technical difficulties.

Sports domes with retractable roofs do not, however, provide a reliable guide as to the probable cost of the Noah's Ark domes. The roof mechanism and the seating and other structures associated with a sporting venue add costs that far exceed the cost of a simple static dome.

The best guidance on probable costs in this case would likely be provided by the case of the Tropical Islands dome near Briesen/Brand in Germany. This was built in 1997, originally as an airship construction hall, but later converted to house a theme park. It is a semi-circular barrel vault with height of 107m, a span of 210m and a length of 150m, enclosed by two half domes at either end. The original cost was EUR120 million[15].

In general, the cost of any structure is a function of the quantity of the various materials that go into its construction. In the case of domes this is directly related to the volume enclosed[16]. The unit cost of this dome, brought to present day values, amounts to 41.5USD/m^3.

[15] "Dome, sea and sand"; The Guardian, 21 Dec 2004

[16] The volume of a dome with a circular profile is given by the equation: $^1/_3\,\pi(3Rh^2 - h^3)$ where the radius of curvature $R = \sqrt{w^2 + (\frac{h^2-w^2}{2h})^2}$; *h* and *w* being the height the span respectively.

Points of difference between the Tropical Islands dome and the Noah's Ark domes are:

1. the construction system of the former uses the segmented arch principle, whereas the latter would be based the cheaper geodesic system;
2. for the coverage of a given area, a barrel vault is more costly than a dome solution;
3. the original covering of the Tropical Islands case was a flexible engineering fabric while the Noah's Ark domes will be more expensively clad in glass or polycarbonate sheeting.

The first two factors would suggest that the unit cost of the Noah's Ark domes will be somewhat less than that of the Tropical Islands dome. On the other hand, the third would suggest the reverse. Therefore, it seems that the safest assumption at this stage will be to adopt the unit cost given above for the Tropical Islands dome.

Costs of the other major structures can be estimated using information provided by AECOM SA (Pty) Limited[17]. These are: the museum, the conference centre, the parking area and the roads and other hard surfaces.

Unit rates at current prices, including VAT at 15%, are given below.

Item	Unit	Rate ($)	Remarks
Museum	m^2	4190	Complete
Conference centre	m^2	2793	Complete
Parking area	m^2	51	On grade

Table 23: Unit rates for construction

Costs per square meter for other major buildings and structures on the site are given on the table below.

Building	Unit	Unit cost	Remarks
Perimeter fencing	$/m	195.5	Source: Clear-View Fencing (Eskom specification)
Entrance gate/guard house	$/$m^2$	1425	Source AECOM Africa
Control centre	$/$m^2$	1425	
Office building	$/$m^2$	1748	
Greenhouse/propagation area	$/$m^2$	42	AECOM as for parking on grade
Veterinary clinic	$/$m^2$	1748	AECOM as for office building
Workshop (M&E)	$/$m^2$	385	Source AECOM Africa
Builders' yard/store	$/$m^2$	42	AECOM as for parking on grade
Warehouse	$/$m^2$	346	Source AECOM Africa

Table 24: Unit rates for other major works

Cost estimates for animal and botanical specimens are given on the table below. These are simply provisional amounts at this stage because there appears to be little, if any, publicly available information to support more precise budgets.

Item	Unit	Unit cost	Remarks
Animals (large domes)	collection	$5.6m	Per dome
Animals (small domes)	collection	$1.4m	Per dome
Trees and plants	$/ha	28000	Average for both domes and exterior areas

Table 25: Costs for animals and botanical specimens

[17] AECOM AFRICA PROPERTY & CONSTRUCTION COST GUIDE 2020/2021.

Infrastructure on the site will include the works, together with their unit costs as listed below.

Item	Unit	Unit Cost	Remarks
88kV/11kV sub-station	Item	$14.3m	Based on budget for Ballito sub-station[18]
11kV/380V sub-stations	item	$0.03m	Based on tender prices Drakenstein municipality[19]
11kV underground cables	$/m	211	Source ADENCO: Hermanus municipality 2015
Water reservoir	Item	$0.14m	Source: Department of Cooperative Governance and Traditional Affairs, "Municipal infrastructure – An industry guide to infrastructure service delivery and unit costs" June 2010 - escalated to current values by the BER building cost index.
Pump-station (1000kl/day)	Item	$0.01m	
Water supply pipelines	$/m	39.3	
Sewerage lines (500mm dia.)	$/m	138.6	
Wastewater treatment plant (1000kl/d)	Item	$1.4m	
Roads (class 3)	$/m	86.2	
Storm-water drainage	$/m	142.9	
Paved surfaces	$/m^2	34.4	

Table 26: Infrastructure costs

Cost estimates for equipment, vehicles and furniture are shown on the following table.

Item	Unit	Unit Cost	Remarks
Office furniture / equipment (per stn.)	$/set	2642	Makro, Techinn, United Copiers
Uniforms and foot-ware	$/set/yr	196	ZDI, Lightinthebox
Tactical jacket	Item	$335	Futurama
Small arms	Item	$838	The Glock Shop
Veterinary equipment	set	$55000	Afrimedics.co.za
Mech. & elect. Equipment	set	$1400000	Nominal amount
Medical clinic equipment	set	$110000	Afrimedics.co.za
Computer server	Item	$28000	Server Warehouse
Minibus (24 seats)	Item	$55866	Toyota South Africa
5 ton truck	Item	$54190	
Patrol vehicle	Item	$26816	
Road sweeper	Item	$167600	MAN TGM 18.330
Refuse removal truck	Item	$98324	Auto Trader 1/11/2022
Self-driving car	Item	$54357	Andrew Lambrecht[20]
Suspended rail set	Item	$3930000	Wuppertal Suspension Railway, Schaeffler Group
Ambulance	Item	$40223	Hyundai Automotive South Africa (Pty) Ltd

Table 27: Costs for equipment, vehicles and furniture

6.10 Human resources

Salaries and wages for personnel would be assumed to correspond closely to those offered by SANParks.

The average personnel expenditure per employee, including UIF and SDL levies, housing allowances, pension fund contributions, etc., would then be as shown below[21].

Patterson Band	Cost per employee
F – Top management	149734
E – Senior management	82313
D – Middle management	45586
C – Junior management	21065
B – Semi-skilled workers	13637
A – Unskilled workers	11163

Table 28: Salaries and wages (USD)

[18] Ref. James Anderson in North Coast Courier, 14 April 2022
[19] 2019
[20] INSIDEEVS, 11/10/2022, "How much does a Tesla cost".
[21] Source: South African National Parks Annual Report 2019/2020, adjusted for public sector wage increases to 2022.

6.11 Supplies and services

Electricity supply would represent the most important operating cost. It is assumed that Noah's Ark will be supplied by the local authority at the same price as that given by Eskom (ZA) to direct customers on the non-local authority Megaflex 3 tariff[22].

Eskom provides an MS Excel spreadsheet that enables prospective customers to calculate the electricity charges under any of its tariffs. On the assumption that the project will have an electrical load factor equal to 80%, the resulting unit price for electricity would be $0.17463/kWh.

Other significant expenses will be water supplies and municipal property rates.

The former, according to the Richard's Bay published tariffs for the 2021/2022 financial year, would be $1.83/kilolitre. The latter would be $0.0024[23] per dollar rateable value. This last, considering the scale of the project, could well be reduced through negotiation with the municipality. It is assumed that Zanzibar would have rates at the same levels.

6.12 Sources of wildlife, plants and specimen acquisition strategies

Each dome will enclose an environment resembling, as nearly as possible, its corresponding natural ecology. This is to create appropriate homes for each particular endangered species, including the plants and trees with which they naturally exist.

Environments envisaged are:

- An European forest (as they once existed),
- The Congo River basin,
- The Mediterranean (as it once existed),
- A tropical Asian forest,
- The Amazon,
- A desert (such as the Kalahari),
- The Arctic (e.g. Alaska or Siberia).

Specification of what will be required is covered in 5.4 above.

Once these are in hand, specialist contractors will be engaged to obtain and transport the specimens required for each dome. However, many specimens will require permits from the governments of both the country of origin and Tanzania in each case. This means that the project would need to comply with all the legislative and regulatory issues involved in the process.

The costs involved are difficult to estimate and so a provisional amount of $11.2m for each dome has been budgeted for the exercise at this stage.

7 FINANCE AND FUNDING

7.1 Scope of the Finance function

Finance functions in any organisation involve three essential activities:

- Budgeting for future expenditures and corresponding cash flows on a long-term (multi-year), an annual and a short-term basis (usually monthly),

[22] Eskom Tariffs & Charges Booklet 2021/2022.
[23] Public service infrastructure.

- Managing cash flows to ensure that all funds due and all borrowings are sufficient to pay for all outgoings at all times,
- Keeping records of all transactions.

7.2 Financial management and staff

The organisation structure of the function will be as follows.

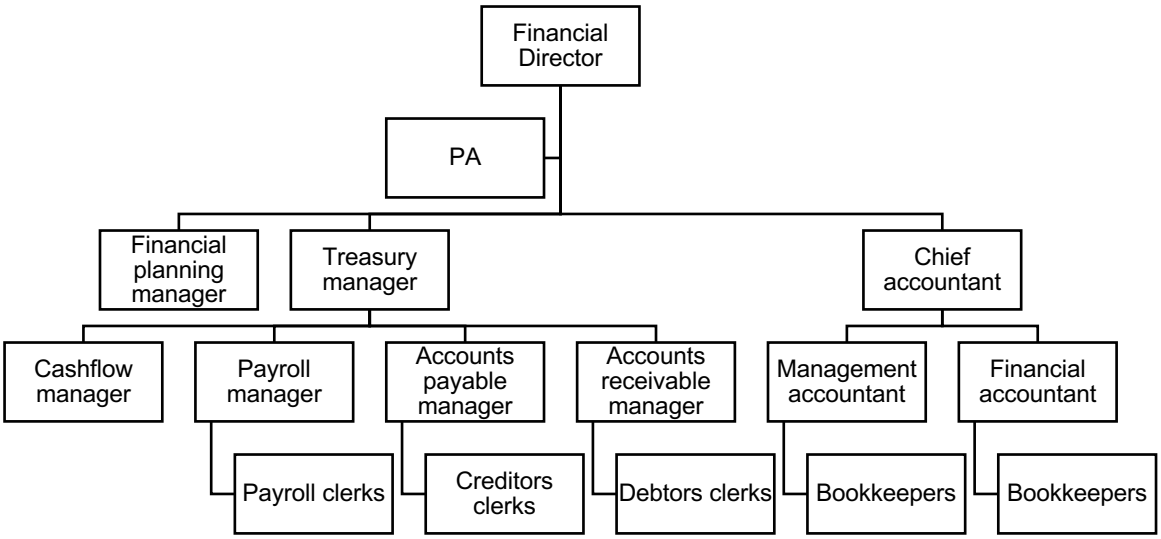

Figure 10: Organisation chart of the Finance function

7.3 Staffing and resource requirements

Staffing, for all practical purposes, will be static throughout the life of the project. Numbers required will be as estimated in the table below.

Band	Year	-2	-1	0	1	2	3	4	5	6	7	8
F	Top managers	1	1	1	1	1	1	1	1	1	1	1
E	Senior managers	3	3	3	3	3	3	3	3	3	3	3
D	Middle managers	7	7	7	7	7	7	7	7	7	7	7
C	Skilled/ lower managers	3	3	3	3	3	3	3	3	3	3	3
B	Front line supervisors	10	10	10	10	10	10	10	10	10	10	10

Table 29: Staffing of the Finance function

The corresponding resource requirements would be as given on the following table.

	Year	-1	-2	0	1	2	3	4	5	6	7	8
Resource	Unit											
Office accommodation	m^2	576	576	576	576	576	576	576	576	576	576	576
Furniture & equipment	set	24	24	24	24	24	24	24	24	24	24	24
Telecommunications	Item	1	1	1	1	1	1	1	1	1	1	1
Water and sewerage	kl	288	288	288	288	288	288	288	288	288	288	288
Electricity consumption	GWh	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 30: Resource requirements of the Finance function

7.4 Financial projections

Economic parameters and financial and accounting policies used in the preparation of the financial projections are given in the table below.

Parameter	Value	Remarks/comment
Inflation rate	3.7%	US Bureau of Labour Statistics Aug 2023
Overnight Fed funds rate	5.32%	New York Fed 08/09/2023
Prime lending rate	8.5%	Forbes 12/09/2023
Deposit rate	5.23%	Equal to overnight rate
Depreciation on buildings and improvements	4%	SARS wear and tear allowance
Depreciation on plant and machinery	10%	SARS wear and tear allowance
Depreciation on Equipment, vehicles and furniture	20%	SARS wear and tear allowance
Allowance for contingencies and unmeasured items		
Capital expenditures	15%	
Operating expenditures	15%	
Revenues	15%	

Table 31: Economic parameters and financial and accounting policies

These parameters, together with the projected cost estimates given above lead to the *pro-forma* financial statements given in the following tables. Details of the calculations involved are available in an MS Excel spreadsheet (file name: Noah's Ark Financial Model).

Income Statements $m											
Year	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Revenue	9.2	35.0	202.2	187.7	251.2	270.1	293.1	322.0	359.7	410.9	483.7
Net operating costs	6.3	7.2	13.4	14.7	16.2	31.7	33.3	37.1	42.1	46.2	48.5
Proceeds of fund raising activities											
Animals and botanical specimens	4.2		1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6
Depreciation	3.4	4.7	19.4	23.1	26.9	27.0	27.1	28.9	29.0	29.1	29.3
Bank fees	1.0	1.0									
Operating income	-5.7	22.1	168.3	148.7	206.8	210.0	231.3	254.6	287.2	334.1	404.4
Net interest received	-1.4	3.7	5.8	3.9	10.7	22.0	37.1	54.0	73.4	96.2	123.5
Income	-7.1	25.8	174.1	152.6	217.5	232.0	268.4	308.6	360.5	430.3	527.9
Retained income b/f	0.0	-7.1	18.7	192.8	345.5	562.9	795.0	1063.3	1371.9	1732.4	2162.7
Retained income c/f	-7.1	18.7	192.8	345.5	562.9	795.0	1063.3	1371.9	1732.4	2162.7	2690.6

Table 32: Income Statements ($m)

Balance Sheets ($m)											
Year	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Capital employed											
Proceeds of fund raising events	5.6	232.4	238.4	244.6	251.1	257.8	264.7	271.9	279.4	287.1	295.2
Retained income	-7.1	18.7	192.8	345.5	562.9	795.0	1063.3	1371.9	1732.4	2162.7	2690.6
Loans	100.0	200.0									
	98.5	451.1	431.2	590.1	814.0	1052.7	1328.1	1643.8	2011.8	2449.9	2985.8
Employment of capital											
Fixed assets											
Land	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Project dev. costs	8.8	15.1	39.4	45.1	51.2	51.5	51.7	52.8	53.1	56.5	56.9
Buildings and works	38.7	56.0	306.0	374.9	446.4	446.4	446.4	446.4	446.4	446.4	446.4
Equipment	2.4	4.0	5.8	7.5	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Vehicles	0.3	0.3	7.3	7.5	7.6	8.1	8.3	16.8	17.1	17.4	18.2
Contingencies	7.1	9.9	48.9	59.7	70.9	71.2	71.5	73.0	73.2	73.5	73.9
Professional fees	15.0	19.1	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
Fixed assets at cost	74.0	106.2	432.5	519.8	610.5	611.6	612.3	623.4	624.3	628.3	629.9
Less accumulated depreciation	3.4	8.1	27.5	50.5	77.5	104.5	131.6	160.5	189.5	218.5	247.8
	70.6	98.1	405.0	469.3	533.1	507.1	480.8	462.9	434.8	409.7	382.1
Current assets											
Bank balances	27.9	353.1	26.2	120.8	280.9	545.6	847.3	1180.9	1577.0	2040.1	2603.7
	98.5	451.1	431.2	590.1	814.0	1052.7	1328.1	1643.8	2011.8	2449.9	2985.8

Table 33: Balance Sheets ($m)

Cash-flow Statements ($m)											
Year	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Cash generated by operations	2.9	27.8	188.8	173.0	235.0	238.4	259.8	285.0	317.7	364.7	435.2
Interest paid	2.1	6.4	4.3								
Interest received	0.7	10.1	10.1	3.9	10.7	22.0	37.1	54.0	73.4	96.2	123.5
Cash available from operations	1.5	31.5	194.7	176.9	245.7	260.4	296.9	338.9	391.0	460.9	558.7
Additions to fixed assets	78.2	32.2	327.5	88.6	92.0	2.4	2.1	12.5	2.4	5.5	3.2
Financing requirement	76.7	0.6	132.8	-88.4	-153.6	-258.0	-294.7	-326.4	-388.6	-455.4	-555.5
Proceeds of fund raising activities		221.0									
Grants received	5.6	5.8	6.0	6.2	6.5	6.7	6.9	7.2	7.5	7.7	8.0
Loans raised	100.0	100.0									
Loans repaid			-200.0								
Banking fees	1.0	1.0									
	-27.9	-325.2	326.8	-94.6	-160.1	-264.7	-301.7	-333.6	-396.1	-463.1	-563.5
Change in cash and deposits	27.9	325.2	-326.8	94.6	160.1	264.7	301.7	333.6	396.1	463.1	563.5

Table 34: Cash-flow Statements ($m)

7.5 Funding plan and sources of finance

The sequence of key milestones that have to be successfully negotiated to bring the project to realisation is as follows:

- Lands suitable for the project will be provided by the government of Zanzibar and the government of Tanzania will be requested to do the same. Site Location Studies will

be needed, in the project development phase, to decide on options offered in country. The studies are estimated at $0.9m

- Once the siting of the project is finalised, portions of the site could be sold to property developers for hotels, a food court and retail outlets. The anticipated initial revenues would amount to $150m.

- Then, a promotions plan to raise awareness about the project on a global basis will be initiated. This has been given the name "You Are Noah" and will be designed to bring the project to the attention of the international media and the public in general. A key aspect of this initiative is that it will involve merchandising branded dog-tags at in-store payment points at as many retail outlets as possible world-wide. It will also involve the sale of music singles, videos and books about Noah's Ark as well as a television series to be sold to TV broadcasters. This implies the establishment of a small, but effective, PR organisation, the costs of which would come to around some $8.4m, including TV production costs.
  These activities are expected to produce net revenues of approximately $10m per year.

- Thereafter, a campaign codenamed "I Am", which will provide a means for the public to pick up and be part of the movement, will begin with a rock concert featuring a line-up of the most popular music, film and television stars and legends from around the world. The purpose of the concert will be to mobilize public support for the objectives of the project and to generate funds for its implementation. A possible venue for the concert will be Wembley Stadium (London UK) with a seating capacity of over 70,000.
  It is anticipated that ticket sales will cover production costs, but that sales of TV rights will result in a $221m contribution to the costs of the project.

- Technical studies will be carried out in parallel with the previous two items. These will cover architectural planning, engineering designs and ecological research studies. In addition, engagement with potential suppliers of goods and services will be initiated with the view to refining cost estimates and preparing strategies for the acquisition of all the goods and services needed for the project. Progressive refinements to the Feasibility Study will be made throughout this process.

The following table has the breakdown of project development and building costs, also professional fees, in the first two years. The total of $138.7m is the funding now sought, to put the Project into construction.

Project Development	Cost	Remarks
Project management	$9.1m	
Options on site acquisition	$3.4m	
PR campaign	$10.9m	Salaries, production and general expenses
Aerial surveys	$0.6m	
Architectural and Town Planning studies	$4.4m	Preliminary designs
Civil engineering studies	$3.2m	Preliminary
Structural engineering studies	$4.4m	Primarily domes
Mechanical and electrical engineering studies	$2.2m	Electricity supply and dome cooling system
Ecological research studies	$0.4m	Environmental specifications for first dome
Sub-Total	$38.9m	

Building Works	$73.0m	
Professional fees	$14.0m	
Total	$161.6m	

Table 35: Initial project development and building costs

8 SUMMARY AND CONCLUSIONS

The Noah's Ark project is by design both ambitious and iconic, aimed at presenting the world's brightest eco-tourism attraction ever – with wildlife from everywhere observed discretely in big spaces (not as in zoos) and full media coverage on TV, in songs and books also concerts – expressly to draw big audiences to the cause. Which is to bring animal wildlife species everywhere back from the brink of extinction, all protected securely, and prepared for their or their descendants' rewilded repatriation whenever that is verifiably safe and sustainable.

From a technical view point that is entirely feasible. There is no engineering structure and no item of plant or equipment in the plan that has not been successfully built somewhere else in the world. With that assurance and with a world leading consultancy providing change and project management – the Nichols Group has been approached – and design – Arup are ready in that capacity – there is no technical impediment or risk in implementing the project's capital works.

Most importantly, leading conservationists, zoologists and botanists supported by leading entities such as Kew Gardens are ready to form the world's first body specialised in biodiversity interdependence focussed on vertebrates. That body will guide the Wildlife Steering Group that will be formed to ensure the project's wildlife ambitions, in reality but also in the eyes of the world, are not only met but even exceeded.

In order to achieve all of that, sustainably, Giles Cooper and Spencer Phillips are ready to jointly head a stunning media campaign that begins with park sponsorships and merchandising and then, as the parks open, the much bigger funding sources of park entrance ticketing and brand licensing will kick in – brand licencing deals are expected with at least three major corporations. Exceptional funding will come from worldwide sales of television and radio rights to concerts – note that just one concert is factored in this study while, actually, a series of annual concerts will be in the programme – all on a scale similar to "Live Aid" in 1985, and certainly bigger than the "Concert for Ukraine" in 2022.

To heighten public awareness even further, in the whole Noah's Ark experience, the Hearst Media Production Group are ready to start filming a full TV Series on the parks. And the Noah's Ark programme of concerts will perform through 2029 to 2031, each year in all three locations of London's West End, New York's Broadway and Mount Kilimanjaro, Tanzania, and continue annually thereafter.

Success in this extraordinary campaign – for saving wildlife – will ensure the whole project is an extremely sound investment and also low risk with fund management by a leading capital works financial management consultancy (e.g. Deloitte) and it is sure to deliver an anticipated internal rate of return over a ten year period of better than 30-35% .