GEDS Design Studio Dimension 2019 Case Study

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We need a new, global spirituality, an organic spirituality that belongs innately to all of us, as children of the Earth.

Barbara Mor, *The Great Cosmic Mother, Rediscovering the religion of the Earth.*
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EXECUTIVE SUMMARY

1. SIPAPU is a 160 acre parcel of primary and secondary rainforest in the Tambopatá Nature Reserve Buffer Zone in the Peruvian Amazon.

2. Sipapu is a Hopi word meaning place of emergence and return – the legendary “world navel” from which their ancestors first emerged, and to which they will ultimately return. Sipapu is also understood as “passage to the next world.”

3. The project forms that “passage to the next world” through sustainable and regenerative principles, methods, culture and technologies born of deep and traditional shamanic worldviews.

4. SIPAPU integrates ecological, economic, social and spiritual methods, business, governance and practices, enabling its function as a sustainable, regenerative and inspirational vehicle for transformation.
THE PROJECT TODAY

The project is in an early stage of development. While the site currently functions as a residence for its 2–4 staff, and as a retreat centre for up to 20 people, it requires development in order to fulfil its mission.

The site currently comprises:

— **ZONE 0 | Accommodation**
  Guardian’s house, ceremonial house, dormitory, kitchen/diner, one flushing WC and shower, two composting WC, water tower and bore hole.

— **ZONE 1 | Frequent visits**
  Well-maintained flower and shrub beds, pathways and covered walkways, riverside seating areas.

— **ZONE 2 | Food production**
  No current provision.

— **ZONE 3 | Plantations**
  Banana, plantain, citrus, avocado, cacao and medicinal plants.

— **ZONE 4 | Secondary forest**
  Medicinal trees including *lupuna, capiruna, sangre de drago*.

— **ZONE 5 | Primary forest**
  Forest trails to 47 mature *castaña* (Brazil nut) trees, streamlets, two fresh water springs and a lagoon.

More on zones in the Ecological Dimension.
VISION

Figure 3 Conceptual model of the Temple

A temple to life and to nature
Open to all sacred paths
Without denomination or dogma
Celebrating the emergence of higher consciousness
And return to right relationship in our role
As caretakers of the Earth.

- **The Tambopatá and Madre de Dios** areas are famed for eco-tourism, with a number of well-established eco-lodges in operation. They are also notorious for ecological destruction caused by illegal logging and gold mining.

- **Temple of Emergence** refers to the **emergence** of conscious community, living in harmony with the Earth, rather than living irresponsibly on it.

- It also refers to the global **emergency** of climate and consciousness, to which the Amazon rainforest – the lungs of the world – is ecologically and symbolically crucial.
MISSION

To establish a sustainable and regenerative community, living in right relationship with nature and with spirit.

To demonstrate exemplary and diverse culture, practices, techniques and technologies needed to support that relationship.

To inspire members, visitors and local communities to high levels of consciousness and care towards each other and the environment.

To be part of and of service to the transformation of humanity’s presence on the Earth.

Figure 4 The Sipapu community placing a selenite heart in the centre of the ceremonial field, April 2018. Selenite is the crystal form of gypsum, a popular building material in the UK.
SUSTAINABILITY, REGENERATION & EVOLUTIONARY ACTIVISM

Sipapu is collectively owned by the project directors, Davina MacKail and Nizami Elé, and graduates of their Ayni Foundation\(^1\) project in the UK.

Since 2015 Ayni Foundation’s programmes, *Return to the Forest*, *Wisdom of the Forest*, *Pilgrimage to Peru* and *Natural Wisdom Leaders*, have built a holistic and initiatic learning corpus around *ayni*, the Quechua principle of sacred reciprocity among and between all beings. Thich Nhat Hanh calls this *inter-being*.

Sipapu is the natural progression of Ayni Foundation’s work. Handover of the land in November 2017 from its previous owner, internationally renowned exponent of the Mesa Tradition of Peruvian shamanism, Oscar Miro-Quesada\(^2\), was conditional upon our continuation and development of the project as a living storehouse of deep ecological and shamanic knowledge, conservation of the land, and participation in the global transformation of human consciousness.

Throughout its development over the next 3–5 years, the project will involve and evolve ecological, economic, social and spiritual methods, business, governance and community practices that enable its mission as a sustainable, regenerative and inspirational node in the global network of evolutionary activism.

PHASE ONE | FOUNDATION
Increment current facilities to better enable residency, retreats, workshops, visits and volunteering.

- Establish Zone 1 and 2 food gardens and agro-forestry
- Construct facilitator house and sanitation block
- Install rainwater harvesting, and grey and black water waste systems
- Install first solar PVC energy system

PHASE TWO | VILLAGE
Modular and sequential construction of eco-village.

- Larger, central “village hall”
- 12 residential domiciles (3 x clusters of 4)
- Rainwater harvesting, and grey and black water waste systems
- Solar PVC energy system
- Community, governance, ownership, rites and regulations.

\(^1\) Ayni Foundation: [https://ayni.foundation](https://ayni.foundation)
\(^2\) The Heart of the Healer Foundation: [https://heartofthehealer.org/](https://heartofthehealer.org/)
PHASE THREE | TEMPLE
A living temple integrating sacred and green design principles

- Inspirational and versatile space for spiritual and community functions
- Local and global tourist attraction
- Requisite water, sanitation and solar energy systems.

DESIGN INTEGRATION

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OUTPUTS
- Food security
- Waste recycling
- Carbon neutral energy
- Carbon neutral accommodation
- Resilient site design
- Spirit of Place
- High level site plan

OBJECTIVES
- Phased development & Fundraising
- Economic resilience
- Productive community
- Regional regeneration
- International visits
- Online training & content
- Eco network participation

MISSION
- Regenerative community
  - Nature and Spirit
  - Diverse culture & practices
  - Inspire members & visitors
  - Consciousness & care
  - Service to the transformation of humanity's presence on the Earth.

VISION
- Temple to life and Nature
  - Open to all
  - Higher consciousness
  - Return to right relationship
  - Caretakers of the Earth.

Figure 5 Design Integration of the Four Dimensions

This report presents a detailed integration of the Four Dimensions of GAIA Education’s Design for Sustainability framework, presented ‘top down:’ Worldview, Social, Economic and Ecological.

Vertical expertise within the design team lead to individual ownership of each dimension. Horizontal integration was achieved by online and collocated collaboration on key design pieces.
The report explores each dimension in detail, evaluating design options against on-site, local, regional, bioregional and global data, delineating guidelines, making recommendations and suggestions for further consideration or investigation.

The report opens with the WorldView Dimension, which is appropriate to a spiritually-oriented project. In these sections we show how the perspectives, narratives and rituals enshrined in the project and its key piece, the Temple of Emergence, combine and contribute to hold the project Vision.

The Social Dimension explores the project community’s experiences thus far, presents analyses and recommendations for governance, leadership, celebrations and forging links to local, bioregional and global communities. It hopes thereby to offer a model for sustainable and regenerative community able to undertake the project Mission.

The Economic Dimension considers the project as a sustainable business, effecting a shift from incubation with seed share-hold funding, to commercial viability, positive local impact and climate change resilience.

Special effort has gone into assuring future sustainability, through for instance detailed analysis of carbon neutral energy design, with reference to the long term sustainability of lithium batteries. Business basics and dynamics are thus shown to support the project Objectives and be supported by its ecological Outputs.

The Ecological Dimension provides an in-depth overview of local and bioregional climate and climate-change factors as preface to guidelines and outline designs of closed-loop, sustainable systems for water, permaculture, energy and buildings.

We next present an introduction to site, bioregion and project, in the current global context of climate change, in order to illuminate Sipapu's role as a hub of evolutionary activism – a leader, leading by example.

The reader is invited to follow this introductory tour, before diving deeper into each dimension. Finally, we draw some overall conclusions, identify outstanding questions, and sign off with a note regards the contributions of each member of the team.

Anne-Flore Racine, Imola Andras & Nizami Elé,

November 2019
INTRODUCTION

Nizami Elé

LOCATION

Sipapu is a 160 acre parcel of land in the Buffer Zone of the Tambopatá Nature Reserve in the Lower Amazon. As the crow flies it is 319km east of Cusco, the old Inca capital, and 30 km southwest from Puerto Maldonado, Peru’s “Gateway to the Amazon.”

The site can only be reached by river boat, requiring a 3–4hr journey upriver from Puerto Maldonado [PM], depending on boat load, and 2–3 downriver to PM.

LEGEND

The Inca possessed an abundance of gold yet did not attach to it the same monetary value that obsessed the Spanish. For the Inca, gold was used in ornaments, statues and jewellery in remembrance of Inti, the Sun God, from whom the Inca, like the Egyptian Pharaohs and Japanese Emperors before them, traced their royal descent.
Hernan Cortes’ and Francisco Pizarro’s conquest of the New World is a tale of cataclysm, in which stark differences in worldview and immune systems combined to offer an incredible advantage to the conquistadors.

Immediately east of the mountain strongholds of the Inca, the Tambopatá may contain the lost jungle cities of the Inca (or older civilisation), known as *El Dorado* and *Paititi*. Both were long sought – without success – by the Spanish during their 1532–72 conquest of Peru. The region continues to fire the imaginations of modern day explorers and gold rush desperadoes.

**GOLD RUSH**

The image above shows an area of ecological destruction approx. 50km wide, near the mining town of Huepetuhe, 250km west of Sipapu.

In March 2019, the Peruvian government launched *Operation Mercurio*, its largest police and military campaign to date, shutting down illegal gold mines in Tambopatá and Madre de Dios and displacing an estimated 25,000 miners. ³

Wildcat mining resembles fracking in that it blasts the earth with water, flocculating gold particles with huge quantities of mercury emulsion. The process yields on average 1g of gold per 10 tonnes of earth. Not only is the forest cleared, but soil structure,

waterway topography and rhizome networks are destroyed, replaced by heavily polluted lagoons.

Like cocaine production, illegal gold mining is a dangerous and desperate business. Predatory loan sharks lend miners the money to finance the operation, which involves heavy use of toxic chemicals, and running a narrow gauntlet between police and military surveillance on the one hand, and regional mafias on the other.

But with gold prices rocketing due to the metal’s role as the traditional store of value in uncertain markets, it is still an attractive option for thousands living below the poverty line. According to the NGO US Aid, gold mining has surpassed cocaine in terms of lucre.  

While it is easy to demonise the desperate fortune seekers of Huepetuhe, Mazuko and La Pampa as the enemies of Pachamama, we must remember: they are in many ways victims of global economic inequality, driven in this case by the gold industry.

But times are changing. While gold and silver are still the default stores of value in times of economic turbulence (not to say collapse), they are not the only ones.

Thanks to the global climate change movement and activism, governments and communities worldwide are recognising the importance of sustainability, be it in the form of renewable energy sources or low carbon footprint services and products.

Bitcoin, the primary crypto currency, has overtaken gold as a market recovery instrument in the context of the US/China trade war.5

4 US Aid.
5 Forbes, 23 August 2019.
This year US Bitcoin investment house Grayscale began a TV and social media campaign dubbed #DropGold⁶, emphasising Bitcoin's advantages over gold as an investment vehicle: it is weightless, costs nothing to store, and is readily exchangeable into other crypto and fiat currencies.

While gold has not yet lost its legendary shine, it has slipped from pole position as a store of value in the investment charts.

Could it be that the Amazon is set to receive further support from an unlikely source, the neo-liberal capital class itself?

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⁶ [https://dropgold.com/](https://dropgold.com/)
Current research into *ethical crypto* focuses for the main part on transparency, disclosure and conflict of interest. Building on this, there may well be a role for crypto projects that link value to sustainability and regeneration.

We foresee exciting developments in the intersections between ecological, cooperative and technological communities. See for instance the post-capitalist crypto currency project FairCoin, “The eco-friendly coin for a fair economy.”  

### LUNGS OF THE WORLD

The Amazon rainforest is often cited as the “lungs of the world.” While, according to some models, it produces approximately 20% of the world’s oxygen, its many plant, microbe and animal ecosystems also absorb oxygen.

The epithet is more clearly understood in terms of the rainforest’s role in sequestering carbon dioxide from the atmosphere.

- Annual global emissions of CO2 currently amount to about 40 billion tons, of which the Amazon absorbs about 5% or 2 billion tons.
- Sipapu’s 160 acres (0.65 km²) amounts to 0.000012% of the 5.5 million km² of the whole Amazon forest, absorbing 0.0000006% or 2.4 tons of CO2 per year.

### ON FIRE

The recent and unprecedented spate of fires across the Amazon have sparked an international outcry for preservation of the world’s largest rainforest. Like melting glaciers and icecaps, the Amazon is subject to the vicious cycle of a cybernetic feedback loop in which global warming further reduces a bioregion’s ability to regulate global warming, as flows of water, gases and biomass unique to the rainforest are disrupted.

So far, the forest fires have been concentrated in Brazil and Bolivia, where they can be understood in relation to resurgence of the political right. Brazilian president Jair Bolsonaro tore up preservationist legislation, dissolved conservation departments and openly encouraged non-indigenous colonisation of indigenous reserves.

Luis Fernando Camacho, the far-right Christian figure recently photographed beside Jeanine Chavez, victor over Bolivia’s first indigenous president Evo Morales in the recent
A NEXUS OF HOLISTIC SYSTEMS

Anthony Hodgson’s work with the International Futures Forum takes inspiration from the holistic sage and visionary Buckminster Fuller to structure a response to the “conceptual emergency” that lies behind the storm of current and imminent crises.

The denunciation of the Goddess in Bolivia’s governmental palace echoes that of the Conquistadors 500 years earlier. Both derive from patriarchal disconnection of humanity from the Earth, something we explore in detail in the Worldview chapters.

The IFF World Systems Map is a nexus of 12 interconnected nodes, instrumental to vital and thriving human community. We use it here to introduce the Sipapu project’s response to the conceptual and climate emergencies facing humanity today.

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11 Nick Estes, University of New Mexico in The Guardian, Opinion 14 Nov 2019
CULTURAL VALUES & WORLDVIEWS
Sipapu’s ethos derives from its directors work with Ayni Foundation, whose holistic self development programmes site the human being in reciprocal and responsible relationship with the matrix of Nature. We may call this ayni, we may call it inter-being, we may call it green psychology. The path has many names. Sipapu’s Temple embraces all of them. Like life itself, the path is ever-evolving. Dogmatism is death. Sipapu’s ethos is about relationship, to the Earth, to others, to our self.

HEALTH & WELLBEING
Again owing to its incubation and training within Ayni Foundation, the project community is accustomed to systems of personal and group practice including diet, yoga, qi gong and meditation. The community includes expert practitioners of many disciplines, including Amazonian and Andean traditions.

With its barely known wealth of medicinal plants, the Amazon has been called ‘God’s apothecary.’ The community is helping restore value and interest in that heritage. Indigenous communities feel a sense of pride that their knowledge has reached all the way across the world and is now returning.

FOOD & AGRICULTURE
Historical tenants of Sipapu were mestizo agriculturalists from the mountains seeking easier lives than that of the high Andes. Sipapu has small-holding scale (about 7 acres in total) banana, plantain, citrus fruits, avocado and cacao plantations.

The project will build on this basis to introduce analogue forestry systems whose operation and maintenance will form a keystone of life at Sipapu, and will provide residents with a balanced, healthy diet. Further afield, in the primary rainforest to the north of the site, trails lead to 47 brazil nut (bertholletia excelsa) trees, each producing 30–40 kg of nuts per year.

The project will initially plant 2 hectares (5 acres) of bamboo, which will filter grey water, sequester carbon, and mature in 4–5 years as a material suitable for craft and construction.

BUSINESS & TRADE
Sipapu’s principle asset is the land itself, whose energies have been honoured and channelled for 20 years by Oscar Miro-Quesada, a process that will culminate in the construction of the Temple of Emergence. In time there will be many visitors.
As an active hub – a go-to place – in the global transformation of human presence on Earth, Sipapu will offer workshops, retreats and seminars, physically and online, sharing its active and evolving wisdom.

In particular, Ayni Foundation’s pioneering and highly acclaimed Natural Wisdom Leaders programme, is being reshaped as a pathway to Sipapu as initiatic experience.

Sipapu will energise and participate in the grassroots local economy, where trade between ecolodges and communities includes indigenous textiles and ecologically sound products. In time, Sipapu’s bamboo, cacao and brazil nuts will be tradable items.

ENERGY & EARTH RESOURCES
The project looks both to indigenous knowledge and experience of living sustainably in the rainforest, for instance the ancient practice of tera preta (biochar), and to modern innovations like Solar PVC, turbines and geodesic domes. In all aspects, systems will be designed to operate synergistically with the spirit and energy flows of the forest.

CLIMATE CHANGE INTENSITY
As a sought-after international destination for personal growth and healing, learning, and for some belonging/coming home to a conscious, supportive and community with a mission, Sipapu’s carbon footprint will increase via visitor use of fossil fuels in order to reach it.

This will be offset by the effect of “the Sipapu experience” on those visitors, and on Sipapu’s partnering with its massively regenerative ally, Camiño Verde, whose mission is the regeneration of bioregions devastated by logging, agriculture and mining.

In time, Sipapu’s learning programmes will be exported to other localities by way of affiliations and partnerships, or as graduates of the Sipapu experience take their learnings home and form other, similarly inspired communities.

ECOSYSTEM FUNCTIONS
That sinking feeling in the heart when confronted with scenes of ecological devastation tells you how Pachamama feels about logging and mining and so on. It may be naïve in some ways but to be guided by that alone will not go far wrong.

But we must go beyond Do No Harm. Sipapu seeks to inspire the local region in natural and eco-friendly treatment of waste, rather than throwing it in the river,
avoidance of non compostable materials, single use plastics, and toxic detergents and other products.

Sipapu’s biomimicry and permaculture initiatives, including tera preta and waste water recycling will increase eco system services via soil quality improvement.

WATER AVAILABILITY
Water is an abundant resource in the rainforest. Sipapu will deploy rainwater harvesting and aquifer systems to provide general and drinking water supply, obviating the current requirement for fresh drinking water to be brought up from Puerto Maldonado.

HABITAT & INFRASTRUCTURE
Sipapu is well-situated to function as a example of sustainable and regenerative community in the Tambopatá buffer zone. Its regenerative culture, and closed-loop regulation of waste products will be crucial as the community grows. Site planning according to zones of use and in accord with spirit of place implement positive feedback loops, generating a healthy community living in synergy with ecosystem and bioregional systems.

ECONOMY & WEALTH
The Tambopatá and Madre de Dios regions encompass fabulous wealth as one of the planet’s last great storehouses of natural diversity. The Amazon accounts for 10% of the world’s biodiversity, and its rivers account for 15% of global river discharge into the oceans.

So far, ecolodges in the area are positioned at the luxury end of the travel market, and while these lodges provide local employment and attract tourism, private ownership sees the bulk of revenue from ecotourism leaving the region.

Sipapu’s collective ownership and integration with local communities allow it to close the economic loops. Local tariffs allow locals to participate. Key members of staff, like Sipapu’s local manager, have an equal stake, practically and financially, in the project, which will participate in local, regional and global green economies supporting and innovating regenerative methods, technologies and products.

GOVERNANCE & INSTITUTIONS
The project is in its start-up phase, collectively seed-funded by 22 community members, and driven by the two directors. Phase 2, the step-by-step funding and construction of a modular ecovillage, complete with essential services, will see the community expand.
Governance builds ground-up from functional groups (e.g. food gardens, kitchen, community health, hospitality) to a Council, which will convene regularly to oversee the running of the project, hear matters arising, take decisions and resolve disputes. As with indigenous communities, informed consensus is the preferred decision-making model.

The legal structure of the project begins with the foundation of the 22 seed investor community, where overall executive power remains with the directors, and will evolve towards a cooperative, not-for-profit model in Phase 2. Oversight and decision-making will rest with a council attended by individuals or working groups directly responsible for asset-ownership, operations, community processes and new developments.

COMMUNITY
The heart of Sipapu’s community will comprise full-time residents, including its current directors, and a flow of day-visitors, retreat-goers, Natural Wisdom students and volunteers. These different aspects of the community will overlap and interact, lending a flat-structure ethos to life at Sipapu, and a feeling that all are welcome and have their part to play.

Community functions will evolve from the ground up, from taking care of food gardens and essential systems, to participation in governance processes (from regular feedback circles to council meetings) and community celebrations.

Salutogenic aspects include healthy diet, daily yoga, meditation and qi gong circles, as well as a range of treatment programmes incorporating hands-on healing, talking/coaching/mentoring, plant medicines and Kambo, the famous Amazonian tree-frog treatment.

The rest of this document describes how these various aspects combine, interact and harmonise in a nexus of interdependent systems supporting a sustainable and regenerative community.
WORLDVIEW

Nizami Elé

“Nothing ever goes one way.” Davina MacKail, Q’ero lineage holder, Director, Ayni Foundation and Sipapu.

AYNI & INTERBEING

“If we look into this sheet of paper even more deeply, we can see the sunshine in it. If the sunshine is not there, the forest cannot grow. In fact, nothing can grow. Even we cannot grow without sunshine. And so, we know that the sunshine is also in this sheet of paper. The paper and the sunshine inter-are.” Thich Nat Hanh, Interbeing

“The state of interbeing is a vulnerable state. It is the vulnerability of the naive altruist, of the trusting lover, of the unguarded sharer. To enter it, one must leave behind the seeming shelter of a control-based life, protected by walls of cynicism, judgment, and blame.” Charles Eisenstein, The More Beautiful World Our Hearts Know is Possible

Inter-being is an awareness of interconnectedness, and an active reappraisal of our place in and effect upon the web of life – a permaculture of human being. The Quechua term for the same principle is ayni or sacred reciprocity.

The Sipapu project is a response to a call to implement a milestone, a touchstone of inter-being/ayni in the heart of one of the most important and most threatened bioregions on the planet, the rainforest.

Sipapu means the “place of emergence and return” from which (Hopi) ancestral people entered the world, and to which they will return at the end of that world.

That world – call it the Twentieth Century, the post-War consensus, the nuclear age, the third industrial age – is coming to and end. The failure of its systems, political, social, ecological, economic and spiritual, dominate the news.

Like forests everywhere, the Amazon has long suffered the depredations of various human activities driven by a worldview of separation and disconnection, including the drilling, blasting and sifting of the extraction industries–oil, timber, minerals, gold–and the mass colonisation of forest areas for cattle and agribusiness, often at the expense of indigenous people’s rights and lives.
By embodying the Andean and Amazonian wisdom of ayni, literally, sacred reciprocity, in other words inter-being in its retreats, workshops, daily practices and outreach programmes, Sipapu will be a participatory hub of living knowledge, exploration, tradition and innovation.

As a regenerative, spiritually-oriented community, Sipapu will embody, evolve and celebrate sustainable and regenerative practices in the areas of food, water, energy, personal growth and evolution, group and community processes, ethos, rituals and governance, under the diverse and inclusive roof of its Temple.

EMBRACING DIVERSITY

“Shamanism is a living practice, constantly evolving, constantly adapting.” Alfredo “Puma” Quispe-Singona, Q’ero Master Shaman.

Sipapu’s Temple is non-denominational, open to all sacred paths – a broad, green church with space for all cultures, races and walks of life. The central ethos, of ayni, inter-being, harmony with nature, will be encoded into the design of the Temple itself, the surrounding gardens, and the systems supporting its resident and visitor community.

As an evolution of Ayni Foundation’s diverse community in the UK, Europe and the United States, Sipapu is a child of the global era, welcoming bodyworkers, business people, seers, builders, teachers, students, investors, explorers, activists, writers, artists, dentists and others.

Sipapu offers a pathway from disconnection into inter-being, in community, in one of the great sanctuaries of Mother Earth. Given the right guidance and structures, Sipapu’s diversity will be a great creative force and a key attraction.

Building a Temple and ecovillage in the Lower Amazon is decidedly out-of-the-box. The project presents huge learning curves in all areas of life, from knowing what plants to plant where, to wording a shareholder agreement, to fostering creativity and inter-being in the community.
There is an urgency to the project, hence its strapline, *Temple of Emergence*, is a play on the Hopi meaning, and *emergency*.

While boxes must be ticked – staff payments, building and maintenance projects, taxes – Climate Change demands all of us think outside of the box in terms of biophysical, community and economic structures.

**HOLISTIC APPROACH**

Like other powerfully distinct bioregions, the Amazon has its own “micro-climate”, driven by the forest’s cycles of water, gases and biomass. To live at Sipapu is to live within a complex system of flows.

Developing Sipapu’s infrastructure and community structure depends on adaptation as much as smart planning. The forest is full of surprises. Things break, trees fall, rivers flood. Much can be learned from traditional indigenous practices as well as the body of Amazonian ecology and permaculture. Of special interest are technological innovations – for instance the solar panel.

The shamanic worldview, wherein all things are interconnected, where other beings and the planet itself are essentially on an even footing with humans, offers a deeply relational perspective on the world.

Many find this empowering. It offers a key to restoring individual spiritual worth or sovereignty, without religious dogma. It cultivates curiosity, lateral thinking, awareness of correspondence of forms, and contemplation of Other – be they human, animal or plant.

The view from Sipapu is the view from ayni, the matrix of inter-being. As Temple, as village, it offers a glimpse of the whole, not as objective spectacle, but as a participatory experience.

**NATURAL WISDOM**

For Goethe and Steiner, nature is the universal medium on which life is expressed, unlike the Cartesian, reductionist view, in other words the mechanistic and machine-minded view, that life is something that sits on top of nature—something separate from nature.

Ayni Foundation’s Natural Wisdom programmes\(^{12}\) provide a pathway to participation in the Sipapu project. These teachings cultivate inner space, the inner forest or garden. By attending to these inner spaces, we integrate them with the wider space, nature, in which we must all grow together.

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\(^{12}\) https://ayni.foundation/nwl/
Niels Bohr criticises the limited, indeed, entirely constructed worldview of reductionism in physics: “isolated particles are abstractions, only observable through their interactions with other systems.”

“Nature appears as a complicated web of relationships between the various parts of a unified whole.” Fritjof Capra, The Tao of Physics

Being conceived in terms of relationship, often animistic relationships with conscious entities, shamanic worldviews are holistic. Interrelations as described by the “butterfly effect” are normal. Nature, for the shaman, lies beyond the world of trees and moons, it is a universal web of inter-being – the matrix. The world as perceived by an individual in that matrix, is a microcosm of the macrocosm. The Great Work of alchemy, is to unify micro and macro: everyone and everything singing from the same sheet.

**CHAOS & TRANSFORMATION**

Reductionist-materialist thinking is machine thinking, the default worldview of our times. As thinkers from Warhol to Baudrillard have observed, it is a worldview that reduces reality to commercial units. Nature has shown over and over – most dramatically via the phenomenon of climate change, that its complex relations and interdependencies defy boxing into such units.

Living with nature is therefore to embrace chaos, not as a detrimental effect to be overcome through engineering, but as a creative force. Briggs and Peat identify 7 principles for creative engagement with chaos:

1. **Creativity** – engage with chaos to find new solutions
2. **Butterfly effect** – allow local to go global
3. **Go with the flow** – work with others
4. **Explore what’s in between** – avoid stereotypes, discover subtleties
5. **See the art of the world** – appreciate beauty in life’s chaos
6. **Live within time** – use time’s hidden depths
7. **Rejoin the whole** – return to inter-being.

Living in the rainforest requires a simple but profound transformation. Life is on the forest’s terms, not ours. Once we accept that, we enter the flow, we enter the ecosystem, we participate. If we don’t, the resistance becomes manifest. Insect bites, accidents, food spoilage, inclement weather. Chaos, does not respect our illusions of separateness. Life at Sipapu is about living with the Earth, not on it.

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13 Seven Life Lessons of Chaos, John Briggs and David Peat.
We identify 7 key transformations implemented by the Sipapu project:

Measurement of quantities → Quality of experience
Sipapu is an experience of transformation. Life surrounded by the Amazon rainforest is difficult to quantify. One must reach for the poetic to express the effect on mind, body and spirit.

Mechanistic → Organismic
A glimpse into the undergrowth of the forest is enough to realise that mechanistic descriptions only make sense in highlighting particular processes of the whole organism, the living, breathing, birthing and decaying jungle.

Control → Participation
Just as the forest is too big, too complex, too interdependent to subject to control, so the diversity of human inner worlds resists control. Rather, humans and forest participate towards mutually beneficial goals.

Competition → Cooperation
The diversity and broad reach of Sipapu’s teaching programmes, rotation of roles and tasks on these programmes and within the on site community ensure that participants are aware of systems, and the links between different moving parts. Personal pride evolves from self importance to taking pleasure in efficiency, going the extra step, contributing seamlessly to the whole.
Objective → Inter-subjective

From quantum mechanics to shamanism to climate change, we know that our presence in the world has an effect upon it. Our presence in a community has an effect upon the group field. Presence to our inner world, with its community of different voices, different aspects of the self, has an effect upon it.

Single-minded → Holistic and systemic

In a massively interconnected web of relationships, single-mindedness risks oversight, blinkeredness, confirmation bias and unforeseen consequence – probably in the form of equal and opposite reaction.

The Sipapu projects three phases, 1 Foundation, 2 Village and 3 Temple build on each other in terms of infrastructure, community and governance structures, from the food, water and energy basics of sustainability, to the interacting systems of the mature project.

Rationalism → Creativity

Rationalism is a laborious approach to complexity. The best laid plans of mice and men often go awry, but love always finds a way. Living, working, teaching, learning at Sipapu is to live necessarily in accord with the patterns of nature. The river, the rain, the fall of night, the habits of insects and animals.

Figure 10 Natural Wisdom students around the fire at AYNI Foundation, 2017
ENERGETIC SYSTEMS

One of the oldest holistic views of the human being is the Vedic system of chakras, or energy centres, which afford an objective view of the human being from outside, and describe the subjective view from inside. The colours of the chakras correspond to the colours of the rainbow, to frequencies of energy and therefore light and sound.

We note that the heart chakra is green, which suggests that the essential connection to Nature is via the heart chakra.

| Throat      | Self Expression. Voice. Participation      |
SHARED SPIRITUAL PRACTICES

“The moment comes when a truth becomes clear, a truth simple as it is wonderful. That saving oneself alone is not saving oneself. Or in any case doesn’t justify us as human beings.” Julio Cortázar, quoted in The Great Cosmic Mother, Sjöö and Mor.

Sipapu is open to the diversity of human spirituality. It is non-denominational, seeks to avoid dogma and the pitfalls through which a community might be or be perceived as a cult. The first of those would be that a particular path is the only path, or a particular deity or aspect of the divine is the only one.

21st Century spirituality in the West draws inspiration from many paths, and is drawn in particular to the esoteric, perennial wisdom within the outer forms of the world’s religions. Thus sufism from Islam, Kabbala from Judaism, Gnosticism from Christianity and so on.

“Shamanism” is difficult to define in theological or philosophical terms. In his exhaustive study, Mircea Eliade draws the conclusion that, while what appear to be shamanic themes occur within the lore of many world religions, the –ism is essentially a western, anthropological theory.

Sipapu’s shamanic cosmovision embraces:

- honouring the Great Mother, Pachamama, Gaia, Mother Earth
- the three-world view of indigenous cultures
- the elements earth, fire, water and air
- the diversity of applications and interpretations thereof.

THE THREE WORLDS & WORLD TREE

Sipapu has a powerful spirit of place, represented by the indigenous *lupuna* tree, widely regarded across the Amazon as one of the guardians of the forest. A number of mature lupunas guard the forest at Sipapu.

These great trees also reflect the shamanic worldview of the World Tree, whose upper branches encompass the heavens, lower branches the middle world, and whose roots tap into the lower world.

Figure 11 The World Tree
At its simplest level, this corresponds to spirit, conscious and subconscious mind, or in Andean/Amazonian terms the eagle or condor, the jaguar or human and the anaconda or crocodile.

The western scientific cosmovision, successively revised by Copernicus, Galileo and by telescopes of increasing power, has marginalised the human being. Once the centre of the universe, the Earth is now one planet, on the fringes of one galaxy among countless others. Logically, the argument goes, there must be other planets that support life. We have yet to find one.

Where the western scientific project seeks an objective viewpoint, from where reality may be glimpsed, stripped of all subjective interpretation, the shamanic worldview is one that integrates subjective and objective, or rather, intersubjective, in one fell, participatory swoop. We all co-exist together within the universe, whose three-world architecture is exactly the same as the universe within each of us.

Thus we can say, as the Sufis said (these days without being burned at the stake): “I am god.” And it is this democracy of spirituality that draws people from all walks of life, all spiritual and religious paths, towards shamanism. It is on this perennial basis that Sipapu founds its rituals, ceremonies and celebrations.

**CEREMONY**

Ceremony is the performance of ritual in sacred space. Ceremonies at Sipapu are inclusive and spiritually democratic. The ceremony programme includes:

- Healing & divination with sacred plant medicines
- Celebration of natural cycles: equinoxes and solstices
- Despachos (offerings) to honour the land and tree guardians
- Despachos at the outset of any building project/phases
- Other community celebrations e.g. birthdays, Sipapu Day.

**INITIATIONS**

The Natural Wisdom Leaders programme conducted from 2015–19 included initiations like vision quests and fasts. These form milestones in the individual journey towards self-empowerment, and bonding experiences between community members.
MUSIC
Music is key to ceremonies, particularly those involving sacred plant medicines, where the music guides the direction of the ceremony and the healing energies or spirits of the plants. In this heightened context, perhaps even more than in general, music performs an invaluable role in community cohesion, identity and diversity.

“Some day music will be the means of expressing universal religion.”
Hazrat Inayat Khan, The Mysticism of Sound and Music.

PLANT MEDICINES
To Western enthusiasts, seekers, spiritualists, the Amazon is synonymous with its famous psychoactive brew, Ayahuasca (*Banisteriopsis caapi*; Quechua: *vine of the soul*). The Andes are renowned for theirs, *Huachuma* (*Trychocemius pachanoi*; Quechua: *without mind*). The legacy of Sipapu is deeply entwined with both these sacraments. However, Sipapu is not another medicine centre in the Amazon.

Thousands of people each year, mostly from Europe and the USA, descend on centres across the Brazilian Amazon to drink Ayahuasca.

While the incredible positive effects on the seeker’s life are well documented – “10 years of psychotherapy in a night” etc – the real nature of these medicines is something deeper than the average Western encounter reveals. Originally the brew was used in two complementary dimensions, to harm and to heal.14

While Western interest has in many cases regenerated shamanic communities across the Amazon, naivety and economic power have also contributed to its degeneration and corruption15, leading to something of a nadir in the recent murder of Shipibo matriarch Olivia Arevalo in Pucallpa.16

Sipapu, in the home of these medicines, has an important role to play in restoring integrity and balance to the use of these sacraments within a spiritual community.

Having trained and worked with both medicines for years and being initiated in Amazonian and Andean indigenous traditions, the project directors see their own arrival at Sipapu as a call to preserve the traditions and living wisdom in the context of evolutionary activism, namely, to support and further the shift in


15 The Implications of Ayahuasca Tourism on the Sustainable Development of Peru. Tomas Gurvicius, University of Utrecht.

global consciousness from the extractive and destructive patriarchal behaviours, towards ayni with Pachamama.

The plant medicines are thus held within the sanctum of the Temple, supporting and protected by the community and its work in sustaining and regenerating the habitat, biophysically and spiritually.

Many will come to Sipapu – to help, to heal, to belong, to live, to visit. While there will be medicine at Sipapu – it will be in the context of the wider project, as opposed to the spiritual “quick fix” that draws many westerners to other centres.

By cultivating medicinal plants – including but not limited to Ayahuasca and Huachuma – Sipapu will play its part in sustaining this invaluable resource, and conserving its use as a sacrament.

At the time of writing, all of the Sipapu community have been initiated into both Ayahuasca and Huachuma. It is not envisaged that these initiations form a compulsory gateway to entry. There are those for whom these paths are not suitable, due to health reasons, for example, and the project will not exclude anyone on that basis.

MEDITATION & BODYWORK
These are a staple diet at Sipapu, as integral to the health of the community as clean drinking water. The community already includes practitioners of various disciplines, including yoga, pranayama, tai chi, qi gong and meditation. These disciplines are also a necessary preparation for working with shamanic plant medicines.

EVOLUTIONARY ACTIVISM

Sipapu’s location just behind the front lines of the global diversity and deforestation crisis stands to make it an important strategic centre, integrating the natural wisdom of indigenous peoples and technological innovation.

Connectivity and outreach via its retreats, educational programmes and links with local, regional and international ecological networks and NGOs like Camino Verde, Global Ecovillage Network, Amazon Watch, Pachamama Alliance and Extinction Rebellion will support its regenerative capabilities.

Sipapu offers visitors a salutogenic and inspirational experience, in which hands-on participation in regenerative work combines with personal healing and self-development. This is a powerful stimulus to initiate a butterfly effect through word of mouth and online channels.
HEALTH & WELLNESS
Sipapu’s community are well accustomed to healthy living, from diet to exercise to meditation. Many are practitioners of yoga, thai yoga massage, qi gong, reiki and so on. The project directors are trained practitioners of Kambo, the famous frog medicine of the Amazon, amongst other Amazonian and Andean traditions.

Sipapu’s holistic health programmes, part of the Natural Wisdom teaching programmes, include teaching, instruction and practice in a range of disciplines. Looking holistically, psychosomatically, “shamanically”, at physical disorders is explored and encouraged, as is the innate ability to alleviate some of those disorders through simple approaches like body and energy work as well as conversation-based therapies and coaching. NWL students are encouraged to develop their intuition.

EQUALITY
Most of the eco-lodges in the Madre de Dios are firmly at the luxury end of the travel market. A high season night at InkaTierra, for instance, costs upwards of $1000. Luxury accommodation in the jungle is expensive. Luxury goods might be brought from town and refrigerated. Linen might be laundered in town and returned, all of which requires boat travel and therefore significant amounts of fuel. The price, affordable by the few, exacerbates the economic imbalance between guests and locals.

With a GDP of $211bn, Peru is the 49th largest economy of 189\(^{17}\), designated a Developing Country according to International Monetary Fund criteria.\(^{18}\)

Tourism accounts for about 10% of Peru’s GDP, on a par with the UK. The highest recorded proportion of tourism is Macau’s 72% in 2018. As any visitor knows, Peru offers a fabulous visitor experience. From Wonder of the World Machu Picchu, to the High Andes and the Amazon, Peru’s rich cultural and archaeological heritage is testament to the fact that many cultures in the region thrived at different periods of history.

In the last twenty years or so, interest in shamanism, including but not limited to plant medicines, has brought many visitors and students to Peru. Another draw is the ecological movement. Peru is home to many unique, and uniquely threatened ecosystems, one of them being the Amazon rainforest.

\(^{17}\) Worldometer GDP by country.
\(^{18}\) Developing Countries by IMF criteria.
To achieve its mission, the Sipapu must play its part as a global project. It has access to networks of volunteers, experts, donors and investors. Like any foreign-owned ecolodge, it will likely be perceived as a foreign project, offering employment. Sipapu currently employs 2–4 staff, and benefits from manager Vito Bolivar’s professional and familiar links with the local community.

Puerto Maldonado is something of a wild west town. The flux of people down from the mountains in search of easier money, comes and goes in waves. This year the police shut down thousands of illegal gold mines in the area of Mazuko and Huepetuhe, 300km upriver from Sipapu. Many of the miners made their way to Puerto Maldonado.

To play its part as a local project, Sipapu will offer a local tariff for workshops, classes, as well as local employment and training. As a ceremonial, ritual, conference or meeting venue, the Temple will be available to local groups, where such relations are appropriate to the Vision and Mission. Peru is highly syncretic when it comes to spirituality. The Catholic saints happily jostle along with sacred rocks, incense and condor feathers.

Scale-linking depends on cultivating and empowering individuals, community and ecosystem for the project to deliver on the global part of its mission:

*To be part of and of service to the transformation of our presence on the Earth.*
BUTTERFLIES OF HEALTH

The butterfly model of health highlights the complex interrelations between components of an ecosystem, taking into account “soft” components like home and family life, as much as ecological components like air and water quality.

“Practising medicine in a sustainable way begins with a focus on prevention and wellness.” Joel Kreisberg.

Sipapu’s vision is a response primarily to the call of the place itself. The area is rich in legends of lost cities and temples, dating back to the Inca and beyond. And with good reason. This part of the world, at the foot of the glacial Andes—the “backbone” of Mother Earth—sees Nature at its most dramatic, as the waters of the mountain cascade through rivers and waterfalls, giving life to the myriad, life-giving waterways of the Amazon.

It is one of the great ironies of the current climate and ecological crisis that this area of incredible diversity is constantly eyed up by extractive industries of one sort or another: minerals, precious metals and logging, and sometimes tourism.
Being relatively isolated, Sipapu is a world unto itself, without access by road, only by the river. Salutogenic practices, customs, habits and processes are therefore essential.

At the same time, life among the great trees of the primary forest, with the insect orchestra playing all night and delightful bird song in the morning, is a fantastic basis for salutogenesis. Whether the mountains, the desert, the sea or the forest, humans have always derived health and pleasure from immersion in nature.

Sipapu's food gardens and kitchen will cultivate and prepare locally grown (if not on site) vegetarian foods. The way the community works, everyone will have a chance at participating in cooking and serving food. Healthy circulation of roles and skills allows the community to benefit from its diversity, and allows people to develop broad skills, allowing deeper, more useful participation in and service to the community, all of which satisfies higher order human needs like belonging, ability to contribute, development of self-esteem.

Many will attend Sipapu for spiritual reasons. It is a green cathedral. Under its broad canopy, health and wellness goes hand in hand with clarity, vision and inner peace. Spirituality at Sipapu is commensurate with the health and happiness of its community, human, animal and vegetal. It is what is called a "high vibration" place.

The forest requires a certain way of living. Following that way is rewarded via positive and regenerative feedback loops. The right vegetables flourish when planted in the right way. Essentials like clean air and water are abundant. The community is coherent in its approach to creating and maintaining those positive loops. Miracles happen.

RESILIENCE
Disasters also happen. Trees fall on roofs, rivers burst their banks, people get bitten by insects, spiders and snakes. It is possible to contract malaria, dengue and yellow fever.

The distribution and rotation of roles and tasks among the community means, ideally, that everyone can do everything, which makes for an adaptable community.

First aid skills and emergency procedures are essential, especially when visitors are staying at Sipapu. Acute cases aside, general health and wellbeing of resident and guest community depends upon:

- Diet – balanced, salutogenic, delicious
- Prevention – yoga, massage, hands-on healing, kambo, shamanic medicines, psychosomatic awareness and attitude
- Personal and community practice – yoga, meditation, qi gong, tai chi
- Meaningful relationship with nature – food and forest gardens.
SOCIAL DIMENSION

Nizami Elé

Figure 13 Sipapu Community in April 2018

COMMON VISION

The project was born when a diverse group of people came together to stump up the cash to purchase the land, and pay for the first two year’s running costs, comprised of essential maintenance and staff wages.

Participation in the project is open to people from all walks of life, who share a passion for the project’s vision and mission, evolved from the personal and group development processes undergone by the group of original investors.

The project itself—building and sustaining a spiritually-inclined eco-village, requires a diversity of skillsets and personalities to satisfy its many and varied functions throughout the marketing and fundraising, building and operating phases.
LEGAL STRUCTURE

A UK Limited Company, The Sipapu Company Ltd, was formed in November 2017, in order to receive investor funds ready for the purchase. Investment was formulated in terms of holding shares in that company, with the two directors holding shares with preferential voting rights, allowing them to maintain control of the Company.

Legal structure is further discussed in the Economic Dimension.

COMMUNITY EVOLUTION

FORMING
The original group of investors came together quickly in the summer of 2017, when the directors shared information that a piece of land was for sale in the Peruvian Amazon. The vendor, it turned out, is connected to the directors in terms of shamanic lineage. It was therefore understood that the land for sale—Sipapu—was no ordinary piece of land, but one that had been selected for its powerful spirit of place.

The directors were at that time hosting the summer retreat of Natural Wisdom Leaders 2017, a year-long programme in shamanism and self-mastery. It was a natural development to invite the students to invest in the project. 10 of the 16 students accepted, of whom 8 are still involved.

Other investors came from the Ayni Foundation community, having attended a number of weekend retreats, and/or the annual Pilgrimage to Peru. The community background brings a high level of trust to the group.

At this stage, the group held monthly webinars to keep up to date. A weekly meditation, in which each member visualised themselves standing on Sipapu’s Ceremonial Field, the site of the future Temple, worked to keep the group ‘tuned in’ to Sipapu itself. Each member chose the compass direction they wished to stand in, aware of the shamanic meaning of those directions, as per the Pachakuti Mesa tradition, the lineage of wisdom and practice underpinning the Sipapu Project.

STORMING
The project community has undergone a number of personal and political challenges. To date, three members of the original group have decided to withdraw. The first realised the project was not the financial investment she wanted it to be. The second wanted to be a Director of the Company, an appointment which a number of the other investors were opposed to. The third withdrew as he felt neither project nor community were a good fit for him personally.
Each was invited to share their complaints/views by way of direct conversation with the directors, and/or a talking circle with the directors and other investors. While these conversations served to ensure that voices were heard and any misconceptions clarified, the complainants stuck to their decision to leave.

Learning from these experiences guides the design of governance and conflict resolution processes below.

**NORMING**

Now in its second year, after two visits to the site and a second intake of investors, the project is on a more even keel. The directors will live full time at Sipapu from February 2020 in order to implement Phase 1.

The focus of the community will increasingly shift to Sipapu. Plans are under way to reconfigure the Natural Wisdom programme as a blended learning programme, with its offline components located at Sipapu. The programme was a huge catalyst at the origin of the project, and it is expected to be a driver of participation, revenue and further investment.

**PERFORMING**

The directors have been able to employ a part time administrator, who has been instrumental in moving forwards on the legal aspects. Thanks to her, the project has benefited from pro bono legal advice, and we will shortly be able to issue shares to the current investors with the appropriate articles and memoranda included in the shareholding agreement.

In terms of operating the project in Phases 1 to 3, roles and responsibilities made clear in this high level plan will facilitate full participation and commensurate reward, be it financial or in kind, of various roles.
All members of the Sipapu community have graduated from

- Ayni Foundation’s Natural Wisdom Leaders programme
- Return to the Forest, Wisdom of the Forest shamanic retreats,
- Pilgrimage to Peru.

All of which are based on the Quechua principle of ayni, or sacred reciprocity, which situates the individual in a living continuum of relationship with others and Nature.

Ayni Foundation’s training programmes include personal and group processes designed to bring aspects of personal and group fields into focus. For example, how childhood relationships or trauma affect attitudes to group and leadership processes.

Graduates of these processes continue to cultivate attitudes of sharing, support, kindness, vulnerability and integrity.

Equally, the directors of the Sipapu project – the directors of Ayni Foundation and the facilitators of these individual and group processes – have learned much from their work to date. A key factor is the recognition across the group that the community, and its collective work, is ready for a bigger challenge. Sipapu is that challenge.

The immediate requirements of the Sipapu project demand an organic growth without which the community would stagnate. Key members of the community
have already evolved into trusted team members, building on what they have learned on the NWL, WOF and PTP programmes to forge leadership roles for themselves within the community. For instance, one member has evolved into the community’s sacred fire and temazcal (sweatlodge) keeper, another into its most prominent musician and music teacher.

On the larger playing field of Sipapu and its attendant global outreach projects, there will be call and space for many others to step up into their own leadership roles within the community and within the project. This availability of headroom, or room to grow, is crucial within a community of this kind.

Through personal growth and development, supported by the leadership and the community, members are able to “discover their medicine” as we say, i.e. find the ways in which they can contribute to the best of their abilities and talents.

By cultivating and nurturing talent via the NWL programme in the field (i.e. working in the forest, with analogue forestry and permaculture projects) Sipapu will sustain a dedicated and developing community.
VISION

Visioning processes were undertaken during the group’s first visit to Sipapu in April 2018. Each participant described their personal goals as well as their hopes and fears for the project.

The central piece of the project is the Temple. This was collectively downloaded during several shamanic meditations with the sacrament ayahuasca, which allowed everyone to connect in their own way to the spirit of Sipapu.

In recent months, global attention has been placed on the Amazon. Record forest fires in Ecuador, Brazil and Bolivia have highlighted the crucial role the world’s largest rainforest plays in sequestering carbon and securing continental and intercontinental flows of air and water.

In Tambopata, the main threat to rainforest ecosystems is illegal gold mining, which uses large quantities of mercury to flocculate tiny amounts of gold from the land, in the process poisoning the earth and waterways.

The Temple at Sipapu will symbolise and celebrate a more conscious way of relating to the Earth, in one of its most crucial bioregions. Temple and ecovillage will participate in regional and global efforts to conserve and regenerate the rainforest.

A temple to life and to nature
Open to all sacred paths
Without denomination or dogma
Celebrating the emergence of higher consciousness
And return to right relationship in our role
As caretakers of the Earth.
REVIEWING THE VISION
The Vision was drafted and circulated among 22 shareholders and members of the Working Group, who responded to the questions below by email.

The results were discussed at the Annual General Meeting of the Sipapu Company, June 2019. Survey results are listed in Appendix 5.

Overall the group felt that:

1. While the vision statement was inspiring, concise and memorable, capturing the values of the group and the project, it was a little vague when it came to who?
2. The statement focussed exclusively on the temple, at the expense of the village.

Lines 4 and 5 below are proposed to reflect the resident community and thriving visitor community aspects of the project. At the time of writing the revised vision is being reviewed for overall clarity and succinctness.

1. A temple to life and to nature
2. Open to all sacred paths
3. Without denomination or dogma
4. Tended by a regenerative community
5. With visitors from all over the world
6. Sipapu is a place of emergence and return
7. To right relationship in our role
8. As caretakers of the Earth.

MISSION

To establish a sustainable and regenerative community, living in right relationship with nature and with spirit.

To demonstrate exemplary and diverse culture, practices, techniques and technologies needed to support that relationship.

To inspire members, visitors and local communities to high levels of consciousness and care towards each other and the environment.

To be part of and of service to the transformation of humanity’s presence on the Earth.
MISSION PLANNING
We conducted a number of exercises with the Sipapu Community to elicit what the project might look like in 50, 25, 10 and 5 years time. Out of this process came the basic outline of the project’s three phases.

<table>
<thead>
<tr>
<th>Developments</th>
<th>Functions</th>
<th>Population</th>
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<tbody>
<tr>
<td><strong>PHASE 1  FOUNDATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Augment accommodation</td>
<td>5 day retreats</td>
<td>5-15</td>
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<tr>
<td>More sanitary facilities</td>
<td>Volunteers</td>
<td></td>
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<tr>
<td>Closed loop water flow</td>
<td>Natural Wisdom Leaders 2020</td>
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<tr>
<td>Install sustainable energy sources</td>
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<tr>
<td>Establish basic food security</td>
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<td></td>
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<tr>
<td>Develop agroforestry</td>
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<tr>
<td><strong>PHASE 2  ECOVILLAGE</strong></td>
<td></td>
<td>10–30</td>
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<tr>
<td>Green building ecovillage</td>
<td>All the above PLUS</td>
<td></td>
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<tr>
<td>Water and sanitation</td>
<td>Retreats</td>
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<td>Energy</td>
<td>Workshops</td>
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<tr>
<td>Agroforestry</td>
<td>Seminars</td>
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<tr>
<td>Community building</td>
<td>Resident community</td>
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<tr>
<td>Governance and membership</td>
<td>Local economy</td>
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<td></td>
<td>Local products</td>
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<td></td>
<td>International outreach (NWL)</td>
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<tr>
<td><strong>PHASE 3  TEMPLE + ECOVILLAGE</strong></td>
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<td>50+</td>
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<tr>
<td>Temple and utilities</td>
<td>All the above PLUS</td>
<td></td>
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<tr>
<td>Governance and membership</td>
<td>Local and international tourist attraction</td>
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<tr>
<td></td>
<td>Ecolodge</td>
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SOCIAL JUSTICE

Given the long and generally painful history of colonialism in Latin America, the project team have sought from the outset to avoid abusing cultural or economic privileges. The project team is mostly white, middle class, educated, with some degree of knowledge and/or experience of Latin America, and a little Spanish language skill. Sipapu staff are Peruvian, working class, and have little or no English language. In the first place, project participants are strongly encouraged to learn basic Spanish. In future we may seek English language classes for staff.

EQUAL STAKES

Peru has been a top tourist destination for many years. There is therefore a well-established culture of dealing with tourists. Economic asymmetries, for instance, are dealt with by tipping, generally with a clear sense of how much is appropriate. Sometimes this asymmetry manifests in tension. Foreigners are seen as walking wallets, locals as money-grabbing.

Given its location, Sipapu is more of a level playing field. Having a fatter wallet, or credit card limit is less relevant in the jungle, where local, practical knowledge prevails.

The Tambopata is a fast-flowing river riddled with sunken logs and sandbanks. Navigating it is something of an art. The directors once asked Vito if he could teach them to do it, in case of an emergency when he wasn’t around. He was a little uncomfortable with the idea, having probably assessed our abilities to drive boats, but also because he is reluctant to erode his own job security.

Much of the working relationship between locals and project members has been shaped by the working relationship between the Sipapu staff and the previous owner, Don Oscar. The current project directors have sought to maintain his fair and family ethos.

To that end, Vito Bolivar, the site manager, is shareholder in the project, with a stake equal to the average investment of £5000, and the directors have agreed to train and employ his two sons at Sipapu in the future.

Vito’s occupation outside of Sipapu is as a taxi driver in Puerto Maldonado, and a boat driver on the rivers. This is hard and sometimes dangerous work. The project depends heavily on Vito, as the only person on the ground full time. Regular phone calls and messages keep the directors up to date, and let Vito know he is not alone, even if the rest of the team are thousands of miles away.

Vito’s attendance at a permaculture workshop focussed on bamboo in October 2019, on behalf of the project, has introduced him to new skills, building methods and contacts. He feels his role is developing, and that he is very much a part of Sipapu’s future. We hope that he will transmit these positive energies to new local staff in the future.
COMPASSIONATE COMMUNICATION

NON-VIOLENT COMMUNICATION
Members of the project community are well practised in non-violent communication. The Natural Wisdom Leaders programme, for instance, uses talking circles to heal personal and group fields. NVC is taught and regularly practised. Community members belong to shamanic, spiritual or medicine circles, which foster a culture of mindful and compassionate communication.

FEEDBACK
As Sipapu develops, the coherence of its resident community will depend on mindful and compassionate communication. Participants will need to give and receive critical feedback in the context of the many tasks and projects to be undertaken throughout the three development phases, and in the running of the site according to mission.

GOVERNANCE
Sipapu began unexpectedly during the summer of 2017. There was a limited window opportunity to purchase the land and existing buildings. A UK LTD Company was formed, with the project leaders as directors and 16 investors as shareholders. Transparent and fair governance has been important from the outset. While the directors benefit from a high degree of trust in the community, the project will codify processes and procedures through company articles, shareholder agreements, a Sipapu “code of conduct” and community feedback and governance structures.

LEADERSHIP
The project is led by the two directors. The community is spiritually oriented, its members being graduates of various Ayni Foundation programmes. The common ethos of those programmes and therefore the project are reflected in the Vision, in other words a valuing of and commitment to caretaking of Nature and preservation of Natural Wisdom, to be celebrated through the various functions of a living Temple to Nature.

While the two directors will remain in position for the foreseeable future (Phases 1 to 3), a means of succession needs to be considered. The directors anticipate this mechanism evolving from discussion at the Sipapu Council, which is the high level talking circle responsible for leadership and governance and therefore mission and vision.
CONSULTATION
The Directors have consulted with the shareholder group on all major decisions and group processes. The group place a high degree of trust in the Directors to develop the project in its initial phases, introducing wider systems of governance and inclusion as it develops.

FEEDBACK & MONITORING

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<tr>
<th>PHASE 1</th>
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<tr>
<td>Talking Circle</td>
<td>Talking Circles</td>
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<td>Project Group</td>
<td>Project Reports</td>
<td>Project Reports</td>
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<tr>
<td>Sipapu Working Group</td>
<td>Council</td>
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PHASE 1
Relies on the project receiving further cash investment via crowd funding. The money will be used to install basic closed loop water and energy systems, revive and expand existing agroforestry systems to provide basic food security, and construct a fourth house, providing accommodation for visitors and volunteers.

The directors will very much be driving the project forwards, thus the main governance structure will remain the Ltd Company for major decisions and strategic matters.

On-site, in the context of specific projects, e.g. digging trenches, building vegetable beds, siting equipment and installations, governance will be in the form of project teams, who will be schooled in the general communication and interbeing ethos of the overall project.

Project progress will be regularly assessed by talking circles, where smaller or localised operational decisions will be taken. More substantial matters will come to the attention of the Sipapu Working Group.

This is a volunteer group, formed of the directors, some shareholders and other participants (volunteers, regular visitors, advisors) that will oversee on site projects. The primary resolution method will be through talking circles.

Disputes may be escalated from the shop floor to the SWG, which will evolve in time (Phase 3) to become the Sipapu Council.

PHASE 2
Building of the ecovillage in gradual, modular fashion, starting with a cluster of 4 domiciles complete with energy and waste processing. Cash will be raised by crowd funding, with investors purchasing vouchers that can be redeemed via time share of domiciles.
It is hoped that the design of the domiciles will itself be a point of interest. Conversations are under way with a number of manufacturers of low-to-zero carbon footprint domiciles that can be assembled on site from flat pack kits. The village will be populated by the growing residential community and visitors.

The Sipapu Working Group, which provides executive oversight and monitoring, will devolve into a number of sub-groups focussed on particular aspects of the project.

2. Food – attendance to food growing and waste upcycling systems.
3. Energy – care and repair of solar PVC installations
4. Water – monitoring water and waste systems
5. Hospitality – retreats, accommodation, looking after guests
6. Community – handling feedback, disputes, processes for resolution
7. Council – more a super-group than a sub-group, regular high level circles.

PHASE 3
The Temple will be a unique construction, something not seen before in Tambopata. Its launch will galvanize visits to Sipapu, requiring effective management of staffing, participation and volunteering. In addition to the 7 governance tracks above, will be the eighth:

8. Temple – management of building and attendant systems.

NATURAL WISDOM: GROWING INTO ROLES
Ayni Foundation’s Natural Wisdom Leaders programme is being redesigned for participation in the Sipapu project. The programme essentially comprises a series of immersions and initiations designed to raise student’s awareness of their wounds, traumas, unexamined assumptions, privileges etc, and build various skills and competences that will allow them to participate in regenerative communities, e.g. at Sipapu, or to form their own.

The new programme will culminate in a retreat at Sipapu, blending teaching, assessment and initiations with hands-on participation in the everyday functions of Sipapu. The programme will support the 8 tracks above, which gives students direct experience of the actual project in action.

The teaching programme thus dovetails with the functional requirements of the residential community, affording Sipapu a stream of switched-on labour, and infusing the teaching programme with learnings from Sipapu.
LEARNINGS FROM DAMANHUR

Damanhur is a highly evolved spiritual ecovillage in Italy, founded in 1975. The community is founded on four pillars, which also form the teaching themes:

- **School of Meditation**: areas of spiritual research and practice
- **Social Pillar**: aspects of community life, citizenship
- **The Game of Life**: stimulating and promoting change, celebration
- **Tecnarcato**: personal transformation, mentoring

Sipapu will see participation, governance and feedback processes evolving into streams aligned with the 8 tracks of governance as follows:
CONFLICT RESOLUTION

Kenneth Thomas and Ralph Kilmann identified 5 strategies people typically use to handle conflict, placing them on a sliding scale of assertiveness and cooperativeness.

Withdrawal from conflict into avoidance sees individuals and groups dig their heels into what Thomas and Kilmann call the Protective Dimension, resulting in organizational in siloes and dysfunction.

While preparatory training and initiation through e.g. the Natural Wisdom programme equips community members with a toolkit of reflective and communicative strategies enabling them to resolve conflict themselves, some conflicts will require escalation to a wider context, first to the ‘committee’ overseeing each of the 7 functional tracks, and if necessary upwards to the Council.

TALKING CIRCLES

Conflict between individuals can affect the whole community. Feedback and governance at Sipapu is therefore designed as a progression of circles, from working groups in the field, to the Sipapu Council.

All members of the community will be schooled in compassionate, non-violent communication, lending practical weight to the transpersonal ethos Im Lakech (Mayan: I am another you).

However, sometimes conflict requires triangulation or mediation via a third party or the group itself, or escalation to groups with wider remit. In each case, the “technology” is the same, the simple talking stick, ideally the same talking stick, which then assumes symbolic power in the community at all levels.

19 See for example, The Participation Company 2016.
**LEADERSHIP**

“*My kind of leadership is about listening to people.*”

*Jeremy Corbyn, Labour Party Leader.*

Leadership within a community must be balanced by the values and consciousness of the leaders, and the governance and community structures in which that leadership has its context. The classic pitfall of a spiritually-oriented community is the descent into cultish autocracy, such as befell Jonestown in Guyana, or Osho in Oregon.

Leadership and governance alike at Sipapu is formed of circles. The simple ritual of the talking circle is employed at all levels, from the ground up. Community members are schooled in this ritual, its importance in maintaining the connection of each member to the group field, and making that group field visible and present.

The system of circles in Figure 13 shows a hierarchy only in terms of escalating dispute resolution. It should be remembered that Sipapu is essentially and fundamentally communitarian. Members of on-site project and oversight groups will also be Council members. The same talking rituals and inclusive ethos are in play at all levels.

**MERITOCRACY AND FACILITATION**

The Natural Wisdom programme provides training in a wide range of contexts and disciplines. All students gain experience in the essential functions of the community, from running ceremonies to cleaning the toilets, and gain an understanding of the importance of this approach in engendering a democratic atmosphere.

Individuals naturally emerge from this process to assume responsibility for specific functions, for example, gardening, running a sweat lodge, carpentry or cooking. These individuals are then responsible for conducting on-site projects, facilitating coworkers in these areas via talking circles, and identifying their successors.

The Sipapu community also calls upon expert partners for help and advice in specialist areas like permaculture, legal and financial matters. These advisors will be called upon to mediate, facilitate and support in relevant areas.
ECONOMIC DIMENSION
Anne-Flore Racine

“The economy is a wholly owned subsidiary of the environment, not the reverse.”
Herman Daly

SUSTAINABILITY AND REGENERATION
FROM COMPETITION TO COLLABORATIVE ADVANTAGE
Economics is a social science as opposed to a natural science, which have natural laws, evolutionary dynamics and ecological boundaries. Up to now, economics had very little regards for natural principles governing life, health sustaining cycles and processes of all biological systems. Rather it focused on the processes by which goods or services were sold. It is apparent now that this kind of economics is outdated and destructive, and this system needs a profound rethink.

Currently rules and policies are designed by humans, and encompass a management system for the generation, exchange and storage of value. This is evidently unsustainable, in the long-term our economic systems should integrate into and nurture the bio-productive and life-sustaining processes and cycles.

This is exactly the model Sipapu is setting out to follow. Where usually new developments would tend to level out the area (i.e. the natural environment) to give them a clear, unobstructed base to build upon, Sipapu is doing the exact opposite in that its buildings are integrated in amongst the trees, making use of available space, and taking advantage of Nature’s opportunities and gifts, for example the natural clearing where the Temple will be built. Sipapu will not expect the natural environment to deal with its waste (i.e. piping out to the river), rather it will take responsibility of its waste, by minimising and reusing/recycling it. Sipapu will not extract the resources it needs from the natural environment (i.e. food, medicines, materials) rather it will work with the natural environment to grow them (i.e. agroforestry, medicine garden, bamboo plantation) so there is always an endless supply that does not deplete the planet’s own, and rather looks to supplement it (regeneration).

Sipapu will look to employ people from the local community primarily (the current staff is indeed very local, and it is hoped that further employees will come from their nearest circle, i.e. family and friends). They will be given employments rights, a fair wage, accommodation, food, job security, training and opportunities in other areas. Their input will be invaluable due to their extended knowledge of the local area, its environment, cultures, traditions; they will be consulted on the management of the site, the day to day running, improvements, etc. they will have a vested interest in the project and their loyalty will be rewarded.
In the wider area, Sipapu will look to work together with other eco-lodges to offer its facilities and services to their visitors (i.e. as a venue). The Temple would be open for visitors coming from other sites who would attend healing sessions, meditation practices and workshops. The workshops and training sessions held at Sipapu will be aimed at local and international students and visitors and will teach sustainable and regenerative design methods in various areas, such as food, medicine, healing, spirituality... Sipapu will also “manufacture” products for use and resale on site, such as medicine and oils. All of which keeps the investment in the local economy, creates employment and partnerships, controls costs, mitigates damages to the environment and offers regenerative opportunities.

Sipapu is clearly illustrating the following model, that the economy and society are subsystems of the environment: the economy always has a social aspect to it, and it is in an environment.

Society however does not necessarily encompass any economic aspects, but it is always in an environment. As for the environment, it can exist without society or economy, but society and economy can never exist without the environment. Therefore, instead of destroying the environment, society and economy should learn to preserve it, to nurture it, and to regenerate it. They should live within it (collaborative), as the diagram below demonstrates, and not alongside it, or rather on the top of it (competitive).

Life creates conditions conducive to life, Sipapu understands this concept very well and aims to create an environment (system) where abundance, collaboration and long-term gains for all beings are optimised.
STAYING WITHIN THE NINE PLANETARY BOUNDARIES

The Planet Boundary Framework was developed by the Stockholm Resilience Centre and an international group of researchers and represents another way of looking at the ecological impact of our current industrial growth society.

Within these boundaries, humanity can continue to thrive for generations to come. Crossing these boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes.²⁰

²⁰ Stockholm Resilience Centre
These nine planet boundaries are:

1. Climate change
2. Change in biosphere integrity (biodiversity loss and species extinction)
3. Stratospheric ozone depletion
4. Ocean acidification
5. Biogeochemical flows (phosphorus and nitrogen cycles)
6. Land system change (for example deforestation)
7. Freshwater use
8. Atmospheric aerosol loading (microscopic particles in the atmosphere that affect climate and living organisms)
9. Introduction of novel entities (i.e. pollutants, radioactive materials, nanomaterials, and micro-plastics)

From the diagram above, we can clearly see that we, humanity, have already crossed 4 out of 9 boundaries, two of which beyond the zone of uncertainty. So how does Sipapu compare, and ultimately how does Sipapu think and do economics on a finite and increasingly fragile planet?

**Climate Change**

Sipapu aims to generate 100% of its own electricity from renewable energy resources (currently solar only, perhaps hydro at a later stage) which will negate the use of a generator (currently Sipapu’s only power source, connection to the national grid is unfeasible), therefore the consumption of fossil fuels. As we know overuse of fossil fuels are directly linked to climate change due to the concentration of CO2 in the atmosphere.21

Sipapu will also look at finding fossil fuel alternative for the shuttle boat, the only access to and from Sipapu (refer to “Further considerations - converting boat engine to biodiesel). They will follow permaculture and organic principles for their food production; therefore, no chemical fertilisers will be used. The only unknown quantity at this stage will be the carbon footprint of the visitors (i.e. long-haul flights), but this could potentially be mitigated in other areas.

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21 Source NASA.
Deforestation is also a contributing factor to climate change and is a great issue in the Amazon. Sipapu is of course opposed to deforestation and will look to protect the trees by teaching others their values and importance. Sipapu will also plant trees where appropriate, as part of its regenerative commitment towards the sacred place that hosts it.

Change in biosphere integrity (biodiversity loss and extinctions)

Life creates conditions conducive to life. At Sipapu all lifeforms are respected and honoured; however, some of them will be kept under control (i.e. “pests” that are a threat to the food production; they will be controlled following permaculture principles, therefore not discriminably destroyed). Sipapu will not result in biodiversity loss, to the contrary it will look to protect and nurture it, even regenerate it where needed. If we are looking for a change, it will be a positive one.

Stratospheric ozone depletion

Although aerosols wouldn’t be used on site due to the unnatural ingredients they contain, globally their production, use and release to the atmosphere are strictly regulated.

Ocean Acidification

Broadly speaking ocean acidification (the lowering of the PH of the oceans, below 7) is occurring because too much carbon dioxide is released into the atmosphere22. By taking the steps detailed above in climate change, Sipapu is also actively contributing towards reversing ocean acidification.

Biogeochemical flows (phosphorus and nitrogen cycles)

No pesticides or chemical fertiliser will be used on site.

Land system change (for example deforestation)

See above Change in Biosphere Integrity. However, it is worth noting that in order to expand the project, new accommodation and sanitary blocks will need to be built, as well other buildings (i.e. workshop), this may require the felling of some trees and clearing of plants and shrubs. Where possible, only trees and shrubs that are old potentially diseased, or are becoming invasive will be destroyed. Other trees and shrubs will be planted elsewhere to compensate, and the vegetation that will disappear for the benefit of the site’s expansion will be wisely used on site, so nothing goes to waste.

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22 Ocean acidification climateinterpreter.org
Freshwater use

Sipapu aims to meet its water needs through rainwater harvesting mostly, there is already a borehole on site and a water pump, which can be used where necessary, as back up (i.e. the stock of rainwater has temporarily run out, which could happen during the drier season when the site is at full capacity). It is unlikely that Sipapu will ever need to pump water from the river, and crop irrigation should be covered by rainfall alone.

Atmospheric aerosol loading

Refer to stratospheric ozone depletion.

Introduction of novel entities

Cleaning, washing and sanitising products used on site will be made of environmentally friendly, natural, easily degradable and nontoxic ingredients. Food production will be organic and only natural fertilisers will be used. Visitors will be advised against bringing toiletries containing microbeads and any other ingredients that does not fit the specification above. Ideally, nothing that can’t be reused or recycled will be brought on site, so it does not end up in landfills.

Single used plastics and other harmful packaging will not be welcome on site. Visitors will be issued with a what to/not to bring during their stay, and Sipapu will be able to provide some alternatives to its customers (e.g. homemade soap and shampoo bars, toothpaste etc).

In its own way, Sipapu will stay within the planet boundaries; through its teachings Sipapu’s model will become an inspiration to others, whether visitors or local individuals and businesses, who will replicate it, reaching others, and so on.

REDUCING INEQUALITY

Inequality drives status insecurity, which in turn increases consumerism thanks to advertising which plays on it, which in turn destroys the planet by plundering its resources. Inequality also has huge health impacts, which in turn increases economic costs on health systems. In short inequality is a huge problem at all levels. It also leads to migration, for example people leaving the countryside to settle in towns in the hope of a better life. Puerto Maldonado, the town nearest to Sipapu is a perfect example, where many have moved further to the Government
shutting illegal gold mines (it is reasonable to assume these workers originally left their villages in the forest to work in the mines).

Large scale industries such logging and mining are also displacing populations through habitat destruction (not mentioning the displacement of other living creatures, i.e. animals).

How does Sipapu address economic inequality? First of all, by providing a sanctuary to all living beings, vegetal, animal and human. Everything and everyone are guaranteed to be treated equally (Eco vs Ego). Sipapu not only provides a safe place to work for the local population but it will also be a place where they can learn and develop skills and techniques of food growing, green building and medicine preparation by using ancient wisdom mixed with new and more scientific based approaches.

Staff will be paid fairly and will be guaranteed rights. They will have food, shelter, social interactions, opportunities to learn and develop. They will have a sense of place and of purpose. Their wellbeing will be as important as the visitors’. They will have access to medicine and learn to respect nature for what it is and offers. Again, the teachings both staff and visitors will gain from Sipapu will be a take home message and will have positive repercussions well beyond Sipapu itself.

**TRANSPARENCY**

Ultimately, Sipapu is a commercial enterprise, and like any other business it must be profitable. We have already established that Sipapu does not intend to become a successful business to the detriment of everything else, but rather by ensuring everything else thrives just as well. However, with all the best will in the world, sometimes there are elements outside of the mindful entrepreneur’s control. For example, the eco-friendly shampoo bars may come wrapped in plastic. Shop bought vegan food may contain soya that has been intensively grown in Argentina, then processed in Europe (food miles). Staff uniform may be made of synthetic fibres because the organic cotton version does not exist/is prohibitively expensive.

It all comes down to thinking ahead, outside the box and remaining true to values. The great advantage of Sipapu is that, as a business it can sustain itself without the need for many external players. For example, there is enough land and knowledge to grow organic, healthy nutritious food on site for both staff and visitors, which accounts for a great proportion of the running costs. Environmentally friendly cleaning products and toiletries are easy to make, and the raw materials can easily be harvested locally if not grown on site. Energy will be generated from renewable sources, with a small decentralised power plant, therefore providing guarantee on the sustainability of its energy requirements. Waste will be treated on site, and actually there is no such thing as waste, since all will be repurposed, even human waste which can be turned into excellent fertiliser.

The lesser known quantity will be the visitors, there are some aspects that can be controlled, such as what they bring and use on site, but there are some that
unfortunately can’t be, such as what they do outside of their stay at Sipapu. It is hoped however that staying at Sipapu will open their minds to the possibilities of creating a fairer, better world.

If anything is brought to Sipapu, there will be extensive investigation done prior to ensure the product or service is as genuine as can be, for example the geodomes that are potentially going to be used for accommodation in phase two, their manufacturing process will be reviewed as much as possible to ensure they are carbon neutral.

By producing the majority of the goods and resources (i.e. electricity) needed on site, Sipapu can not only guarantee the origin and traceability of its products, it can also guarantee that they are free from any hidden externalities as explained above, as well as subsidies that might have negative effects elsewhere. By not relying on and worse benefitting larger organisations, Sipapu increases its integrity but also remains free to provide goods and services to its customers factoring in all true costs of its operations, which ensures a fair deal all round.

“Small is beautiful, big is subsidised.” Helena Norberg-Hodge
REGENERATION AND CARBON

Sipapu is in a lucky position in that it is already located in a healthy ecosystem, thanks to the previous owners paying much attention to the needs of the natural world and ensuring it remained preserved and undisturbed, and that anything added to it, for example the buildings, was done in a considerate way with long-term thinking. Unfortunately, this is not so true for the not so wider area, due to illegal logging and mining. Many farmers still believe the slash and burn practice is the only way to efficiently grow crops.

Although the site which Sipapu occupies does not need to be regenerated per se, one does not have to go very far to see the devastation on the natural environment.

Sipapu’s vision is “A temple to life and to nature, Open to all sacred paths, Without denomination or dogma, Celebrating the emergence of higher consciousness, And return to right relationship in our role, As caretakers of the Earth”.

Sipapu defines itself as Caretaker of the Earth. By inviting others to stay with and learn from them, it can not only demonstrate the importance of a healthy ecosystem but also teach others how to look after an ecosystem so it stays healthy, and beyond that how to revive, or regenerate an ecosystem, to bring it back to its healthy self.

Sipapu applies system thinking and regenerative approach to its surrounding environment, and to a degree the wider environment. Once it becomes fully operational Sipapu will be a place for spiritual as well as physical healing and a knowledge centre to help others and the environment.

Sipapu understand that by contributing to a healthy and properly functioning ecosystem and by ensuring it stays that way, it can freely gain huge benefits such as nutrient cycling, primary production, soil formation, habitat provision and pollination (supporting services); food, raw materials, water purity, biogenic minerals, medicinal resources, energy, ornamental resources (provisioning services); carbon sequestration and climate regulation, prey population regulation, waste decomposition and detoxification, purification of water and air, pest and disease control (regulating services); and finally cultural, spiritual and historical, recreational, educational, and therapeutic services (cultural services). Collectively these are known as ecosystem services.

The site itself will become carbon neutral, therefore those coming to stay at Sipapu will lead carbon-neutral lives, even if temporarily. Currently the site relies on a generator for power, and the shuttle boat also uses fossil fuels. Then there is the added carbon footprint of every single visitor coming to stay. Sipapu will need to address this in two stages, first its own carbon footprint, which is the easier one to calculate and mitigate. Actions are already in place, soon the site will be powered by solar, and in time other shuttle options will be considered, even if in the meantime this may mean converting the boat engine to biofuel.

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23 Ecosystem Services, [Wikipedia](https://en.wikipedia.org/wiki/Ecosystem_service)
The second stages will be to look at the visitors’ footprint. This may be difficult to calculate, and Sipapu can only realistically take responsibility for the carbon footprint associated with its visitors coming to site. This can be much easier to calculate, and therefore it will be easier to mitigate.

Although some argue that long-haul flights are not as polluting as they may sound they are still a consideration. If the carbon footprint of the visitor is only limited to transportation, and a value can be put on that transportation in CO2 emissions, an simple mitigation option would be to request that each visitor plant a or several trees depending on how much CO2 emissions they have to compensate for. This could be done practically and as a ritual for example, or alternatively they could fund the planting and maintaining of the tree(s). Another option would be a tree sponsorship which could guarantee a tree will protected and looked after for its lifetime.

The key here will be to come up with a practical solution as opposed to a financial one only, to avoid speculation.

SUSTAINABLE DEVELOPMENT GOALS

In 2015 the United Nations ratified 17 Sustainable Development Goals, which resulted from the UN’s process of expanding and reframing the Millennium Development Goals. They are “the world’s best plan to build a better world for people and our planet by 2030 [...] they are a call for action by all countries - poor, rich and middle-income - to promote prosperity while protecting the environment.

They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health,
equality and job opportunities, while tackling climate change and working to preserve our ocean and forests.” Sipapu meets every single one of these goals.

GOAL 1: No Poverty – everyone paid a fair wage
GOAL 2: Zero Hunger – homegrown, organic, nutritious food for everyone
GOAL 3: Good Health and Well-being – healthy environment, healthy mind, healthy body
GOAL 4: Quality Education – opportunities to learn new skills
GOAL 5: Gender Equality – everyone treated equally
GOAL 6: Clean Water and Sanitation – rainwater harvesting system, safe waste and sewage treatment, sanitary blocks
GOAL 7: Affordable and Clean Energy – solar powered community
GOAL 8: Decent Work and Economic Growth – see goals 1, 3, 4 and 5
GOAL 9: Industry, Innovation and Infrastructure – good transportation, onsite manufacturing of goods, provision for satellite connectivity
GOAL 10: Reduced Inequality – see goals 1, 2, 4 and 5
GOAL 11: Sustainable Cities and Communities – see goals 1 to 9
GOAL 12: Responsible Consumption and Production – see goals 1 to 10
GOAL 13: Climate Action – see goals 4, 6 and 7
GOAL 14: Life Below Water – Sipapu describes itself as “a Temple to life and Nature”
GOAL 15: Life on Land – see goal 14
GOAL 16: Peace and Justice Strong Institutions – see goals 1 to 15
GOAL 17: Partnerships to achieve the Goal – see goals 1 to 17

QUALITATIVE GROWTH
The Growth Domestic Product (GDP) is commonly used worldwide to measure an economy’s progress and success in financial terms (quantitative). It is the total monetary or market value of all the finished goods and services produced within a country’s borders in a specific time period.

As a broad measure of overall domestic production, it functions as a comprehensive scorecard of the country’s economic health. It includes all private and public consumption, government outlays, investments, additions to private inventories, paid-in construction costs, and the foreign balance of trade. Researchers have warned of, and

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25 Investopedia
we are now witnessing the devastating environmental effects of uncontrolled growth and rapid resource depletion of a finite planet.

“Too much and for too long, we seemed to have surrendered personal excellence and community values in the mere accumulation of material things. Our gross national product counts air pollution and cigarette advertising, and ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for the people who break them. It counts the destruction of the redwood and the loss of our natural wonder in chaotic sprawl. It does not allow for the health of our children, the quality of their education or the joy of their play. It measures everything in short, except that which makes life worthwhile.”

Senator Robert Kennedy, 1968 in Capra & Henderson (2013:2)

If anything, GDP seems to measure our failures as a human species rather than our growth. However, as Capra and Henderson put it, no growth isn’t the answer. Growth is a characteristic of life, what does not grow will soon die. And equally growth in nature isn’t unlimited, it is finite and circular, after an organism has grown, it starts declining, releasing its components which become resources for new growth.

Humanity needs to take inspiration from the natural world and shift from an economic system based on the notion of unlimited growth to one that is both ecologically sustainable and socially just.

In order to do that, we need to understand the difference between good growth and bad growth. For example, bad growth would externalise social and ecological costs of the degradation of an ecosystem (see above Transparency) while good growth includes more efficient production processes involving renewable energy, recycling, regeneration of ecosystems etc...

Unfortunately, humans have caused so much destruction that simply being sustainable is no longer enough. If we are to attempt to reverse the damage we have done, we need to be more than sustainable, we need to be restorative, even regenerative.

This means that we can no longer try to change the existing model, we need to build a new one. This is where Sipapu has a role to play.
Sipapu is building a carbon neutral commercial enterprise with a social and environmental objective. Its activities do not require much of the Earth’s resources, as they involve teachings and passing on knowledge and experiences, which are built on the understanding of the Earth.

The resources it needs, i.e. energy, food, shelter, water, it will work in partnership with the Earth to obtain. For example, it will collect the water falling from the sky and not pipe it from the nearest town (which would be logistically impossible) or worse bring it in plastic bottles/containers. It will use the sun’s energy to provide power and replace fossil fuels. It will work in partnership with nature to grow the food it needs (permaculture) and if it ever needs any resources it will make sure to increase that resource first so that nature’s capital is never depleted (for example planting and growing bamboo for future construction projects, as opposed to cutting down trees to build and then replant trees at a later stage).

Sipapu will implement a circular economy system. The well-being of not only the ecosystem but also of those living in it, human and non-human, is the most important aspect of Sipapu’s mission, so much so that it will endeavour to teach others how to recognise, measure and improve this well-being. It does not intend to do this alone, achieving this will require the involvement of the local community who will want to deal with Sipapu either by working for, trading with and even better those who will learn from this successful regenerative business model and who will recreate it in their community.
Visitors from all over the world will be inspired and go home revitalised, with a higher level of consciousness, enabling them to become effective actors of change. To conclude, let’s have a look at the Capital Institute’s principles of regenerative capitalism based on holistic understanding of whole systems health. Sipapu will adhere to these principles.

- Nurturing right relationships
- Viewing wealth holistically
- Staying innovative, adaptive, responsive
- Empowering participation
- Honouring community and place
- Using the “edge effect” (collaborative diversity) to create abundance
- Establishing robust circular flows (regeneration)
- Seeking balance between efficiency and resilience, collaboration and competition, diversity and coherence, and between small, medium and large organisations and needs

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*Figure 18 Designing a circular economy. Ellen Macarthur Foundation*
ECONOMIC RESILIENCE

“Market economics values what is scarce – not the real work of society, which is caring, loving, being a citizen, a neighbour and a human being. “ Dr Edgar

Money makes the world go round they say, and it is unfortunately very true. Our societies trade amongst themselves, forge and break relationships with it, we all use it constantly in our daily lives, without even realising it, too many of us don’t have enough of it, and very few have too much. It is such a common thing it is almost regarded as trivial, and this is where the danger lies.

Money as we know it today is relatively new in our history. Before our currencies of today came to be there were countless of local currencies in each country and other means of trading were in place, such as barter. And money itself as in notes and coins was not always in use, people exchanged beads, shells, grains, beans, precious metals and cattle. It is important to understand that money isn’t created by Government, and that of all the money coming into circulation only a very small percentage takes the tangible form of coins and notes.

The fact is more than 90% of all money is created by banks in the form of debt. This is referred to as Fiat money, a currency without intrinsic value that has been established as a currency (https://en.wikipedia.org/wiki/Fiat_money). It does not have any use value; it isn’t backed up by any commodity. It only has value because a relationship exists between supply and demand. It was introduced in the 70s and used globally further to the decoupling of the US dollar from gold by Richard Nixon.

Because this “debt” has to be repaid with interest, more money has to be created. For economic growth to take place (and it needs to take place exponentially), new investments require new debts to be issued, and consumption has to increase to keep everything going.

And there we have it, a material culture addicted to the rapid exploitation of non-renewable natural resources and levels of fossil fuel consumption that are driving us beyond humanity’s safe operating space, beyond planetary boundaries and towards a
future of catastrophic climate change. A system which transfers wealth from the poor to the rich.

“All that we borrowed up to 1985 or 1986 was about $5 billion. So far we have paid back about $16 billion. Yet we’re being told that we still owe about $28 billion... because of foreign creditor’s interest rates. If you ask me what is the worst thing in the world, I will say it is compound interest.” President Obasanjo of Nigeria

It becomes clear now that we also need a rethink of our economic and monetary systems if we are to become a successful, regenerative, resilient and sustainable culture. Let’s explore some practical alternatives Sipapu could implement in its participation to a more resilient economy.

**CURRENCY SYSTEMS**

The official currency in Peru is the Nuevo Sol; US dollars are also used and accepted, especially in touristic areas. A number of Local Exchange Trading Systems have been launched in Peru including the Community Exchange Service. These services require laptop or mobile apps to function, and therefore internet connectivity. Until Sipapu has an internet connection, it will be difficult for local exchange trading to take place.

The project is investigating 4G mastband solutions, along with participation in ethical cryptocurrency schemes like FairCoin.

Meanwhile, participation into local, regional and global green economies is likely to be via associations and affiliations with local fair trade networks and NGOS, like The Pachamama Alliance, World Land Trust and EcoTierra.

A complementary currency on the ground would only be useful at Sipapu if it is also useful elsewhere. Factors governing the success of ethical crypto-currency are complex, and outwith the scope of this report.

**TRADING SYSTEMS**

There could be advantages in using complementary currencies to trade with visitors and local communities. One of the main advantages is that the trading activities would not be dependent on outside events, as the “currency” used will be local and the trade

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26 According to Wikipedia there is a type of local exchange trading system (LETS) in Peru called the community exchange system (CES), which uses open source software to deliver an online trading platform.
made by a local population among itself. Some of the visitors of Sipapu could potentially offer some of their time and labour (the volunteers) in exchange for a place to stay, food, holistic teachings.

There could be a bartering system created between Sipapu and local communities, as Sipapu will be able to offer the spare produce grown/fabricated on site to other tribes coming to trade on site, offering their own produce/crafts. Knowledge could also be part of the bartering system.

Sipapu would still need to have access to hard local currency, to pay its taxes for example, and trade with the local town when necessary. This could be achieved by organising retreats/workshops where knowledge, use of the venue, etc is provided at a price and not exchanged for work/time.

It is not believed at this stage that implementing a complementary paper money system would be beneficial. Bartering and time-banking seem to offer a much more social, collaborative and empowering approach. It also negates the hierarchical value given to products and services in favour of a value based on needs (i.e. a loaf of bread isn't worth x amount of currency, it is worth another favour because one really wants a loaf of bread for their dinner, and I really need half an hour of someone’s time to help me with something).

Also due to the early stages of development of the site, it is labour and knowledge that will be most needed to carry out the various projects. Admittedly materials may need to be bought, ideally most will be made/sourced locally, but with limited funding to start with, it makes sense to offer something (i.e. food, a place to stay, an experience) in exchange for someone’s time and labour contributing to the development of Sipapu.
FUNDRAISING
The project’s three phases will be crowd-funded. Research and evaluation of the various funding platforms identifies CrowdFunder\textsuperscript{27} as the best way of presenting Sipapu as a global conservation project to profiled donors, with flexible options in the case of under or over-funding specified target. This report refers primarily to Phase 1.

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<thead>
<tr>
<th>PHASE 1</th>
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<tbody>
<tr>
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<td>10k</td>
</tr>
<tr>
<td>Solar PVC &amp; batteries</td>
<td>13k</td>
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<tr>
<td>Shower &amp; WC block</td>
<td>2k</td>
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<tr>
<td>Septic tank</td>
<td>2k</td>
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<tr>
<td>Rainwater harvesting system</td>
<td>2k</td>
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<tr>
<td>Food garden stock and tools</td>
<td>1k</td>
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<tr>
<td>Gardening shed</td>
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<tr>
<td>Volunteer provisions</td>
<td>1k</td>
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<td>Refrigerator</td>
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<td>– Solar PVC</td>
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<td>– Sanitation</td>
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<th>£ ESTIMATED COST</th>
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<td>Temple</td>
<td>£250k</td>
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OTHER SOURCES
The project will investigate other sources of funds during 2020, including government, NGOs, Foundations and the ecotourism industry.

LAND TRUSTS AND COOPERATIVE STRUCTURES
The World Land Trust\textsuperscript{28} is the go-to model for international conservation via trustee ownership. Sipapu’s original and current legal body is a UK limited company with

\textsuperscript{27} Crowdfunder website.
\textsuperscript{28} World Land Trust website
international shareholders. The shareholders were consulted at the last AGM, June 2019, regards transferring their shareholding into trusteeship. The response was lukewarm. It was agreed, however, that the land of Sipapu is to be held in perpetuity, and is not to be sold in the foreseeable future. This agreement has now been incorporated into the shareholding agreement.

Following a process of legal consultation, the project roadmap anticipates the formation of a Peru-based not-for-profit cooperative, which will handle operations like retreats, workshops and seminars, while the current UK Ltd company will remain as the land management company, receiving a modest rent from the NFP, paid as annual dividends to the shareholders.

- Vito Bolivar, whose dedication to the land makes all of this possible, is a shareholder in the UK-based LTD.
- Shareholding in the UK Ltd will be closed end of 2019.

RENEWABLE ENERGY OR CARBON NEUTRAL COOPERATIVE SUPPORT

Renewable energy cooperatives are gaining momentum in Europe. These structures enable people to allocate the money they would otherwise spend on their electricity bills into renewable energy, either by investing into infrastructure or by buying from larger producers.

Sipapu will be powered by renewable energy, this being an alternative to a diesel generator, not the national grid (the site is too remote for this). In a way the money saved by not buying fuel could go towards the funding of the renewable infrastructure, although this would be seen in the form of a payback.

STAKEHOLDER VALUES

If we are to create a more sustainable human presence on Earth, we need to strengthen local and regional economies in global collaboration, exchange and solidarity. A resilient and regenerative global economy depends on vibrant economies at the national, regional and local levels, and will care for all people, local ecosystems and the biosphere as a whole. If we fundamentally transform the way we live and work and manage to collaborate as one big human family globally and locally, we will create a better and more meaningful life for everyone.

“We are at a threshold in human existence, a fundamental change in understanding about our relationship to nature and each other. We are moving from a world created by privilege to a world created by community. The current thrust of history is too supple to be labelled, but global themes are emerging in response to cascading ecological crises and human suffering. These ideas include the need for radical social change, the reinvention of market-based economics, the
empowerment of women, activism on all levels, and the need for localized economic control.” Paul Hawken (2007: 194)

We are all contributing to the world we live in, how we work and what for, what we buy, how we live. The way we earn and spend money is an extremely contributing factor to either the continuation of a degenerative and ultimately auto destructive system, or to the birth of thriving communities and vibrant regenerative economies.

Adults spend a good bit of time at work, nearly a quarter of it\(^{29}\), so it is essential that they don’t just earn money in the process but also that they take this opportunity to provide social, ecological and economic benefits to their families, friends, community and essentially all life. We need to learn to distinguish between quantitative growth and qualitative growth. Our current economic system is designed to maximise the former and we need to shift to the latter.

\(^{29}\)Ref revisesociology.com
PROJECT VALUES

The way we work and who we work for can influence the way our economic system will progress. It should be a business priority to ensure they offer workers an ethical working environment and equally it is the responsibility of the consumers to choose to spend their money with ethical enterprises.

Sipapu means, *Place of emergence and return*. Temple of Emergence refers to the emergence of conscious community, living in harmony with the Earth, rather than living irresponsibly on it. It also refers to the emergency of climate and consciousness we find ourselves in. Sipapu aims to be entirely self-sufficient in energy generation, food production, water supply and sewage treatment. It also aims to grow some or all of the materials needed to build its expansion, including the Temple which will be the core element of the site, providing a place of peace, freedom and spirituality.

The staff employed will all be locals, creating direct employment in the community. It also aims to provide workshops and experiences, and to become a business model to be recreated elsewhere, thereby providing indirect employment.

This above illustrates how Sipapu as a commercial enterprise provides an ethical working environment for its employees, therefore those working there will earn their money whilst contributing to social, environmental and economic benefits.

Visitors from all over the world will be welcomed at Sipapu, either directly (staying on site for retreats/workshops, volunteers) or indirectly (tourists staying at nearby eco-lodges, visiting the site via organised jungle hiking expeditions; or those receiving teachings online through videos, conference calls, downloadable documents), who will be provided with a rich and meaningful experience about wholistic living, which will transform their consciousness. They will be taking this experience home with them and be able to implement meaningful changes in their personal lives and maybe even their local community (snowball effect).

This illustrates how Sipapu’s customers can choose to spend their hard-earned money with an ethical enterprise, and equally how Sipapu can give its customers the opportunity to contribute to social, environmental and economic benefits by choosing to financially support this enterprise.

ETHICAL CONSUMPTION

Consumers’ choices as we have determined is just as important if not more in fact than a business’ ethics. If all consumers made ethical choices, they would have the power to change all businesses’ ethics. In order to guide the consumer in their choices, labels have been created such as organic, local, fair trade, cruelty free...

All the produces used at Sipapu will be local, the majority even being produced on site. All will be organic, at least in principle. “Organic means working with nature. It means higher levels of animal welfare, lower levels of pesticides, no manufactured herbicides or artificial fertilisers
and more environmentally sustainable management of the land and natural environment, which means more wildlife.”

Strict regulations apply to the organic appellation. Sipapu’s main business activity is not to provide organic goods for sale, rather the organic produce will complement Sipapu’s main income generating activity which will be retreats.

FOREST PRODUCE
It is unlikely that food produce from Sipapu will be exported internationally. It will be used on site, some may be retailed at a later stage of the project, including to local community. Sipapu does not aim to supply for sale but to supply for itself, therefore it is unlikely that excess food produce for example will be available for sale.

Higher value products, such as Dragon Blood, which has antiseptic properties will be available for retail on site, and later, in town at appropriate outlets. Produce will be produced by staff and volunteers

FAIR TRADE
Fairtrade is about better prices, decent working conditions, local sustainability, and fair terms of trade for farmers and workers in the developing world. By requiring companies to pay sustainable prices (which must never fall lower than the market price), Fairtrade addresses the injustices of conventional trade, which traditionally discriminates against the poorest, weakest producers.

It enables them to improve their position and have more control over their lives. Sipapu does support Fair Trade however as with the organic appellation, it is unlikely that it will ever apply for the license to use the Fair Trade mark as it isn’t envisaged at this stage that any of the produced will be sold commercially at a large enough scale to warrant it.

STAFFING
The staff will include locals paid a fair and decent wage. During employment they will be resident on-site and therefore benefit from its quality of life.

FULL SUPPLY CHAIN THINKING
Sipapu aims to be self-sufficient in terms of energy generation, food production, water supply and sewage treatment. Energy will come from renewable sources and will be stored and used on site.

30 **Soil Association**.
31 **Fair Trade Foundation**
• Food produced will be suitable for the local bioregion
  o no invasive species
  o bioregion-indigenous food
  o no chemical pesticides
  o water from rain and aquifer
  o waste water recycled through reed beds
  o composting and vermicomposting toilets
  o biochar used to sequester carbon in the soil and fertilize via microbial action.

By producing the majority of the goods and resources needed on site, Sipapu can guarantee they are free from hidden external costs, as well as subsidies that might have negative effects elsewhere.

This is also true for services provided. By not relying on and worse benefitting larger organisations, Sipapu increases its integrity but also remains free to provide goods and services to its customers factoring in all true costs of its operations, which ensures social, environmental and economic benefits.

COLLABORATIVE CONSUMPTION
A new consumer culture is beginning to emerge where the traditional borders between producers and consumers are blurring (pro-sumers) enabling collaborative consumption and peer-to-peer collaboration.

Can Sipapu take inspiration from this new culture? For the most part the site will produce what the site needs, in terms of food, energy, medicinal products, raw building materials, maybe even toiletries. Therefore, all those living on site will be working towards the wellbeing and comfort of the community, in their specific field.

Sipapu offers participatory opportunities vis a vis design for generosity32. There is work to be done on site, growing food, maintaining the buildings, agro-forestry system, paths, sewage system and other elements, as well as delivery of workshops and courses.

The site is open to those who want to come and help by bringing their own skill set, or learn new skills (i.e. bamboo construction, medicinal plants), time and effort being exchanged for accommodation.

Online platforms like ServiceSpace, Laddership and MovedByLove could be used to present and manage gift economy services tied to volunteering at Sipapu.

32“Radically generous acts that change the world.” Nipun Mehta, initiator of ServiceSpace.
TREE SPONSORSHIP

Sipapu is the home of many mature trees, many of them with herbal-medicinal properties including healing for snake-bite, as skin tonics, antiseptics and ointments. Among many other species are 47 mature Castaña trees, and several very large lupuna (or kapok) trees, both widely respected as guardians of the forest.

The project is exploring methods of gift-economy and appropriate marketing that will enable support for forestry and custodianship of the land via a donation mechanism that allows donors to sponsor a particular tree. In return, donors receive a virtual package including information about and images of the tree, perhaps of an offering being made in their name, and future updates by subscription.

This project may well develop into a partnership with Camino Verde, in which new trees will be planted. Various forest conservation groups operate tree planting and dedication as a gift service in the UK.

SOCIAL ENTERPRISE

Local economies have been replaced by large-scale corporations. This is especially obvious in town centres, where locally-owned shops and family run businesses that formed an integral part of the community have been forced to shut down as international chain stores open outlets on the outskirts of town (commercial centres).

This has been made possible by huge subsidies to these corporations, allowing them to “factor out” social and ecological costs (externalities, cheap labour from underdeveloped countries, cheap fossil fuels to transport raw materials) from their production costs, enabling them to sell standardised goods at a price smaller independent shops could never compete against.

These corporations drive their production costs down by depleting the Earth’s natural resources (water, minerals, metals etc) at unsustainable rates, polluting and driving our consumption up all the time through clever advertising, which in turn increases their production levels, therefore depletes natural resources even more, and so on.
As consumers we can either tie the noose around our necks or open our minds to a better future.

**WHAT IS A SOCIAL ENTERPRISE?**

“A social enterprise is an organization that applies commercial strategies to maximise improvements in financial, social and environmental well-being.“ Wikipedia.

The aim of Sipapu’s commercial activities is to teach and promote social and environmental well-being, by healing the self and the Earth, and providing an example of a sustainable enterprise that can be replicated elsewhere. It aims to actively take part in and regenerate local economies, and to contribute to healthy ecosystems functions.

“Social enterprises can be structured as a for-profit or non-profit, and may take the form (depending on in which country the entity exists and the legal forms available) of a co-operative, mutual organization, a disregarded entity, a social business, a benefit corporation, a community interest company, a company limited by guarantee or a charity organization. They can also take more conventional structures.” Wikipedia

Currently the land is owned by a UK limited company. However, it is not possible for foreign businesses to operate commercially in Peru therefore a new legal structure needs implementing. Some details have been finalised, and we are going into this in further details below (see Legal structure). It is expected that the final set-up will be a for-profit organisation.

*Social enterprises have both business goals and social goals. As a result, their social goals are embedded in their objective, which differentiates them from other organizations and corporations. A social enterprise’s main purpose is to promote, encourage, and make social change. Social enterprises are businesses created to further a social purpose in a financially sustainable way. Social enterprises can provide income generation opportunities that meet the basic needs of people who live in poverty. They are sustainable and earned income from sales is reinvested in their mission. They do not depend on philanthropy and can sustain themselves over the long term. Their models can be expanded or replicated to other communities to generate more impact."

Sipapu is a commercial enterprise therefore will need to be economically viable if it is to be successful in the long run. This will be achieved through the income-generating activities detailed previously. Both Sipapu’s vision and mission clearly illustrate its social (and environmental) goals.
STRENGTHENING LOCAL ECONOMIES

The New Economics Foundation recommends plugging economic leaks through which revenues flow out of the ecosystem. By mapping where goods and services consumed come from, the leaks can be plugged.

Sipapu will be self-sufficient in energy generation. Energy will be generated from on-site renewable sources. This will reduce the need for fossil fuels for power generation.

Sipapu will grow food and materials like bamboo on-site, helping reduce external expenditure.

While funds raised to date come from overseas Sipapu will be able to financially support itself, with revenues from commercial retreats, workshops and training programmes remaining in the local economy.

BIOREGIONAL DEVELOPMENT

“Imagine a world where everyone, everywhere lives happy, healthy lives within the limits of the planet, leaving space for wildlife and wilderness. We call this One Planet Living, and we believe it’s achievable.”

33 https://www.bioregional.com/one-planet-living/
The Bioregional Development Group in London has devised another extremely useful tool to aid in the relocalisation of low carbon economies by providing key points to consider when aiming to create conditions for One Planet Living, the One Planet Living Sustainability Framework.

**Health and Happiness**

Everybody will be encouraged to help grow nutritious food, trees and plants, maintaining buildings, building new ones, maintaining paths, gardens, cooking, washing, etc. Everyone will be part of a working group, depending on their existing skill sets/what they are willing to learn, there will be opportunity to rotate groups periodically so to learn new skills/meet new people.

**Equity and Local Economy**

Employment for locals will be created, directly and indirectly. Opportunities for local communities to trade among themselves, opportunities to learn and gain new skills. Employment protection though shareholding opportunities.

**Culture and Community**

Opportunity to protect and revive local customs and traditions, craftsmanship, knowledge. Opportunity to offer teachings and wisdom to people worldwide coming to visit the site.

**Land Use and Wildlife**

Applying permaculture principles, land and wildlife will be honoured, conserved and regenerated.

**Sustainable water**

Water will be collected from the rain; stored in tanks then distributed across the site. Compost toilets will be used on-site to minimise water use and allow the reuse of their by-products as fertilisers. Grey water will be treated for reuse (bamboo plantation). Some areas on site are currently prone to flooding (i.e. high river levels, collection of rainwater on ground) which will be taken into consideration into final site design.

**Local and sustainable food**

Grown on site following permaculture principles of seasonality, integration, adaptability, diversity etc. No chemical fertilisers will be used (rather organic compost made from humanure (compost/vermicompost toilets), food waste (i.e. peels), garden waste (i.e. dead leaves)) nor pesticides (use of plants and animals to control bugs/insects etc.).
Sustainable materials

Organic waste will be composted for use as fertilisers. The site will aim to produce some of the raw materials needed for construction and development such as bamboo. There is plenty of wood locally although the aim would be to not cut down any trees, or as little as possible. If trees are cut down, they will be replaced in an effort of conservation, even better regeneration (more trees planted than cut), and all the cut tree will be used so no waste is unnecessarily generated.

Sustainable transport

Growing food and generating electricity on site will substantially decrease the need for off-site transport. Visitors will need to be transported, but this could be restricted to a changeover day once a week. Converting the boat’s engine to biofuel may align it with renewable sources grown at Sipapu in future. Practical solutions need to be developed in case of unavailability of fuel for the boat longer term. Hand-paddle canoe is not an option due to the force of the river when going upriver.

Zero waste

Waste will be minimised/recycled wherever possible (e.g. compost of organic waste). There will be no single use containers/packaging (unless for medical emergency which at the moment cannot be compromised), which cannot be composted. The aim for Sipapu is to become a zero waste to landfill site and ultimately a zero-waste site.

Carbon neutral

Power on site will be provided from renewable sources. Strict rules will be displayed on site regard use of power and water. Buildings will be made from natural materials as much as possible such as bamboo and hemp-crete.

REECONOMY

The ReEconomy Centre\textsuperscript{34} offers entrepreneurs a support network and facilitates regional collaboration. The Transition Core Resourcing guide focuses on raising vital funds for a project’s core activities.

Crowdfunding, tree sponsorship, donation of services and equipment will see the site attain increasing commercial viability as a retreat and workshops venue. Sipapu will welcome visitors, partners, students and volunteers throughout 2020 to help construct and maintain Phase One. Gift economy mechanisms like Tree Sponsorship/Dedication will also raise funds.

\textsuperscript{34} Reconomy.org
REGENERATIVE ENTERPRISE

Optimizing for Multi-capital Abundance by Ethan Roland & Gregory Landua explores how entrepreneurs can contribute to regenerative development. They define ‘regenerative enterprise’ as “a venture that pro-actively grows and cultivates the foundational pools of social, cultural, spiritual, and living capital by providing goods and services in a way that creates net positive gains for the system as a whole”.

Their theory of how a regenerative enterprise should be designed and function within the context of a holistic model of the economy is based on eight forms of capital\(^{35}\). Sipapu sustains these eight capitals as follows:

**Social**

The influence, relationships and networks the project can draw upon include:

- Local staff
- Project directors, investors and their networks
- International advisors
- International ecological, cooperative and permaculture networks
- Gaia Education GEDS Design Studio team.

**Material**

Land, infrastructure and physical assets. Ethical private ownership of rainforest reserves is an effective way to protect and conserve them. The Sipapu Company Ltd will not only protect Sipapu’s 160 acres from non-regenerative or destructive activities (logging, mining, cattle farming) but add value through the ecologically sound

\(^{35}\) Ethan Roland & Gregory Landua
construction of the Temple and eco-village, and the technologies and practices that sustain them. Built assets will include:

- Renewable energy systems
- Sustainable water systems including solar-powered purification
- Cutting edge green building design
- Cutting edge design aesthetics
- The Temple
- Canopy yoga/meditation platform.

**Financial**

According to plan, the project has depended upon the seed investment of the 22 shareholders of The Sipapu Co Ltd to purchase the existing land and built assets, and finance staff and maintenance costs for two years. This report inventories the project’s status quo and pathways for sustainable development.

Development will take place in three phases, with Phase 1 commencing in Q1 2020. Each phase will be crowd-funded, with a range of services, products, tokens or offers tailored to the phase, being exchanged for invested capital.

Funding will also come via the following channels:

- Retreats and workshops
- Natural Wisdom
- Partner retreats and workshops
- Donation/dedication/sponsorship campaigns.

**Living**

Sipapu is a healthy place to live. The project will make it even more so. The more people wake up – at Sipapu or elsewhere – the greater the value of places that conserve and honour the beauty and life support of Nature.

Natural assets include brazil nut, banana, citrus and plantain trees, with avocado, cacao and other trees with medicinal applications. Natural assets will increase in quantity with the installation of and attendance to sustainable systems for growing food, medicinal trees and plants, and bamboo, which has a host of applications from textiles and crafts to construction.

Integrating food, water, waste and energy systems in scalable and sustainable patterns contributes to material, living and intellectual capital alike.

**Intellectual**

As a holistic, regenerative enterprise, Sipapu requires a diverse range of skills, expertise and experience, personal and collective drive, group coherence and resilience, creativity, adaptability and sustained inspiration.
Sipapu’s community will be formed by those with whom its mission resonates most actively, many of whom will have experienced integrative and initiatory self-development, training, practice, feedback and coaching via Ayni Foundation’s Natural Wisdom programme. Sipapu’s growing community of friends and advisors includes experts in finance, business and legal, marketing, filmmaking and creative as well as experts in renewable energy and bioregional permaculture.

Sipapu’s most valuable asset is thus its combined knowhow and experience of

- personal and group development
- spiritual initiation and integration
- feedback and conflict handling
- practicing *ayni* or *inter-being*
- leadership and participation
- running retreats and workshops
- digital skills
- business skills
- ecological design and practical skills
- local, regional and global networks.

With participation at Sipapu as its focus, *Natural Wisdom* will evolve as a leading programme of positive initiation and transformation towards initiating and sustaining regenerative communities.

**Experiential**

To arrive at Sipapu is to enter a garden. The flowers, the astonishing birdsong, the diversity of plants and shrubs and the great trees behind. The unforgettable sound of the insects at night. Stars, moons, and the river rushing silently past.

It has been medically proven, via the positive action of phytokinins on our cells, that just being in the forest is good for you.

Every human body feels this uplift. Hence forest bathing is now prescribed in Japan for all kinds of complaints.

At the same time, one is out of the western comfort zone. The rainforest takes getting used to. There are challenges. There are rewards. The Sipapu experience is one of quiet transformation. The more acclimatised one is, the more one appreciates the gift of this experience.

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*Figure 25 Music at Sipapu*
timeless, peaceful place, and feels motivated to conserve and protect it and other places like it. For it is in these places that we rediscover what being human means.

**Living**

Life at Sipapu is holistic. The human community cannot but be aware of it. It must, figuratively and literally, be very aware of its own shit. If a sewage problem is not remedied, water-borne disease may result. If food gardens are not tended to, crops may fail. If a dispute is not attended to appropriately, it may poison the whole community.

Thus the Sipapu experience, as a visitor, retreat-goer or resident, is one of taking responsibility, not counting on the flush of a toilet handle to make something disappear. To be sustainable, to survive the climate and consequent social emergencies on our doorstep, we must take responsibility for all of it. The group, its food, the buildings, the shit. Life at Sipapu is a profound relearning.

**Spiritual**

Sipapu is about harmonious community living. It is a place where deep personal connections to nature and to source are made, and where one experiences ayni/inter-being within a community and surrounding ecosystem.

The *Temple of Emergence* will focus spiritual capital within a unique, innovative design that integrates sacred geometry and energetic flow with sustainable and regenerative principles.

**Cultural**

Sipapu conserves, evolves and demonstrates traditional and innovative knowledge and knowhow alike. It is a bridge-building enterprise, that draws inspiration from ancient teachings, contemporary indigenous cultures like the Shipibo-Conibo, Huni Kuin, Yawanawa, Ashaninka and Matses, as well as innovative solutions to contemporary problems of climate and environmental change. Sipapu's culture is communitarian, salutogenic and regenerative. Honouring all beings, its vision and mission define a pathway to co-evolution with our ecosystem neighbours in sustained conscious living.

As visitor experience, learning immersion, healing therapy, Sipapu's culture is powerful medicine.
BUSINESS PLANNING

Sipapu must survive economically, as a business, if it is to sustain itself and undertake its mission. As a “transition project” it must be able to work with the current economic paradigm, whilst helping dream and manifest the new.

That requires detailed examination of the global and regional economic climate, and a clear understanding of the project as an operation with a financial costs and business opportunities as much as the goals and ideals of its vision and mission.

This section presents guidelines and recommendations for the business aspects of the project.

PLANNING A SUSTAINABLE BUSINESS

With permission, we used the *Flourishing Business Canvas*\(^{36}\) to capture business design inputs and outputs for Sipapu. This particular version of the widely-used Business Canvas tool, has been developed to support a vision very much aligned with ours:

“A world where human enterprises no longer merely attempt to do less harm, but instead set at their core the goal of sustaining the possibility for human and other life to flourish on this planet for seven generations – contributing to the realization of the UN SDGs and beyond.” John Ehrenfeld, MIT.

The canvas integrates the economic, social and environmental dimensions of the project through 4 perspectives, in each case, by asking salient questions:

- **Outcomes**
  - What are the environmental, social and economic goals?
  - How does the business measure benefit resulting?
  - How does the business measure cost?

- **People**
  - Who are the actors in the ecosystem and what are their needs?
  - Which of these will the business satisfy (value co-creation) or deny (value co-destruction)?
What roles do these actors have in the business?
What relationships are involved?
What channels are used to deliver the business values?

**Value**
- What values are co-created with stakeholders, satisfying their needs?
- What value are co-destroyed for stakeholders, denying needs?

**Process**
- What are the governance activities and resources?
- What partnerships are in place?
- What resources are required for the business to achieve its goals?
- What biophysical stocks (materials, living and non-living) are moved or transformed by the business?
- What activities does the business need to carry out?
- What ecosystem services are used, required, harmed or improved?

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We can summarise outcomes from the process as follows:

- **Sipapu** seeks to create **value** through its various channels in terms of **health**, **wellness**, **home**, **spirituality**, **belonging**, **awareness** and **synergistic systems**.

- Stakeholders include **people** formally connected to the business as well as other **ecosystem actors** not included in standard business planning.
• Sipapu’s **processes** involve **biophysical stocks, ecosystem services, resources, partnerships, business activities** and **governance**, all of which are interconnected.

• Sipapu must balance **bioregional, social** and **economic costs** and **benefits** in order to meet its **goals of viability, sustainability, regeneration and global inspiration**.

The Flourishing Business Canvas forms an at-a-glance map of the entities involved, their relationships to the project and the ecosystem it must function within. It is a working document, perhaps best deployed on the wall of meeting spaces etc, where the breadth and depth of the business in a regenerative context is readily apparent. Sipapu can be seen to deliver against its highest level goal of being a living temple with a global mission.

**FUNDING**

Seed investment from the 22 shareholders of The Sipapu Company Ltd provided for purchase of the site in November 2017, and staff and maintenance for the two years since. Sipapu has successfully run two retreats in this time. A third is scheduled for February 2020, when the project enters Phase 1.

Development is scheduled in three phases, Foundation, Village and Temple, with estimated costs as per the table below.

<table>
<thead>
<tr>
<th>PHASE 1</th>
<th>£ ITEM COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitators’ house</td>
<td>10k</td>
</tr>
<tr>
<td>Solar PVC &amp; batteries</td>
<td>13k</td>
</tr>
<tr>
<td>Shower &amp; WC block</td>
<td>2k</td>
</tr>
<tr>
<td>Septic tank</td>
<td>2k</td>
</tr>
<tr>
<td>Rainwater harvesting system</td>
<td>2k</td>
</tr>
<tr>
<td>Food garden stock and tools</td>
<td>1k</td>
</tr>
<tr>
<td>Gardening shed</td>
<td>1k</td>
</tr>
<tr>
<td>Volunteer provisions</td>
<td>1k</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>0.5k</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>£32.5k</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHASE 2</th>
<th>£ ESTIMATED COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Domicile Module</td>
<td>50k per module</td>
</tr>
<tr>
<td>— Solar PVC, Sanitation</td>
<td></td>
</tr>
<tr>
<td>Connecting walkways</td>
<td></td>
</tr>
<tr>
<td>Canopy viewing/meditation platform</td>
<td>20k</td>
</tr>
<tr>
<td></td>
<td>20k</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHASE 3</th>
<th>£ ESTIMATED COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temple</td>
<td>£250k</td>
</tr>
</tbody>
</table>
Funding for development phases will be sought via crowd-funding, with the shopping list itemised for maximum transparency and donor engagement with what each phase of the project is hoping to achieve. Crowdfunder.co.uk has been selected via in house study to evaluate different platforms.

Revenue from direct sales of Sipapu's retreats, workshops, participatory programmes and visitor experiences as well as online materials including but not limited to the Natural Wisdom teaching programme, will be folded into the project. The Directors of these activities will be resident at Sipapu from Q1 2020 onwards.

**TREE SPONSORSHIP**
The Project would do well to re-run the Business Canvas process specifically for this activity, which would feature as an online campaign with various channels of its own. Following the Woodland Trust in the UK and many other conservation organisations, the market for non-stuff gifting and donation has grown, commensurate with general awareness of ecological damage and the need for regeneration.

Tree sponsorship in the Amazon would receive donations from all over the world, in exchange for digital participation in the project via

- Images and information about specific trees
- News and updates and the project.

**OTHER FUNDING SOURCES**

The project is now undergoing the shift from incubation via seed investment, to economic viability through core sales (running & maintenance) and crowd-funding.
(capital development). It has been agreed that the circle of seed investing, i.e. shareholding in The Sipapu Company Ltd will close in 2019.

Future funding can therefore be sought without diluting seed investor shares. Rules and regulations applying to shareholding have been formalised as a Shareholding Agreement.

**LEGAL STRUCTURE**

- The Sipapu Community Ltd, with 2 Directors and 16 shareholders was formed in November 2017 to purchase the site.

- From completion of Phase 1 onwards, commercial operations in Peru (the retreats and workshops) will be carried out by a Peruvian-registered business, ideally on a cooperative model, with not-for-profit ethos and/or legal structure.

- Further research and legal advice are required to evaluate the exact form, articles and memoranda. The Sipapu Company as of November 2019 has 22 shareholders.

- AYNI Ltd (UK), Puma Adventures Cusco and Camino Verde (Peru) will become regular trading partners as Sipapu develops. Of these AYNI forms the link to the UK and international market.

- Puma Adventures Cusco derives all of its revenues from international visitors, and it may well be that its relationship with the Sipapu Project becomes more closely knit.
The project is constantly developing relationships of various kinds at the local and global levels. Those with local partners will come to the fore from Phase 1 onwards, and contribute to direct sales and on-site development. Global relationships with NGOs, conservation and innovation groups form Sipapu's ecological shift network.

**BUSINESS PLAN**

A formal business plan is being worked on, in collaboration with the project’s business and legal advisers and partners. The high level design expressed in the Business Canvas forms the key input into that process. The project may wish to revisit the Canvas exercise on successful completion of Development Phase 1.

**SWOT**

Feasibility was explored by the GAIA Education Design Team via analysis of Strengths, Weaknesses Opportunities and Threats. The top line findings are shown below. For the full list of items see the SWOT Appendix 4.

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Facilities</td>
<td>Climate Change</td>
<td>Accessing site</td>
</tr>
<tr>
<td>Shared values</td>
<td>Local knowledge</td>
<td>Great Shift Participation</td>
<td>Communication links</td>
</tr>
<tr>
<td>Training &amp; development</td>
<td>Complexity</td>
<td>Creative outreach</td>
<td>Community disputes</td>
</tr>
</tbody>
</table>

**EARTH RIGHTS**

In Aldo Leopold's vision of a land ethic[^37], the relationships between people and land are intertwined: care for people cannot be separated from care for the land. In order to create an economic system that integrates human economy into the ecological life-sustaining and resource-regenerating cycles of nature in ways that do no damage to local ecosystems and biosphere, we need to address the issue that we live in a world where non-human species and ecosystems have no rights.

> “There is an urgent need for a Jurisprudence (system of governance) which recognises that the well-being of the integral world community is primary, and that human well-being is derivative.” An Earth Jurisprudence, Thomas Berry

The late and great eco activist Polly Higgins[^38] campaigned for courts all over the world to recognise the crime of ecocide, or crimes against Nature[^39]. Her call has been picked up by the popular activist movement Extinction Rebellion, as well as by indigenous leaders involved in the global eco protest movement.

[^37]: Aldo Leopold’s Land Ethics
[^38]: Polly Higgins’ website
[^39]: Stop Ecocide Campaign
We have a moral responsibility to the natural world, which we need to see as a community to which we belong, and which we must treat with love and respect.

Leopold wrote that “we can only be ethical in relation to something we can see, understand, feel, love, or otherwise have faith in.” He believed that direct contact with the natural world was crucial in shaping our ability to extend our ethics beyond our own self-interest.

Sipapu is involved with Extinction Rebellion, indigenous leaders from Peru and Brazil, as well as various groups active in the campaign for nature and earth rights. Sipapu has applied to be registered as an Earth Protector with the Stop Ecocide Campaign.

**NATURAL WISDOM**

AYNI Foundation’s pioneering and flagship programme Natural Wisdom Leaders forms the genesis and nurturance of Sipapu through sales revenues and influx of intellectual and social capital in the form of people prepared for participation in the rainforest.

The learning themes of NWL 2.0, launching Q3 2020, will dovetail with the community themes or tracks of Sipapu, which form tracks of apprenticeship/mentorship/eldership as individuals learn with, participate in and help develop the project.

The Sipapu Retreat and NWL brochures are included as Appendices.
ECOLOGICAL DIMENSION

Imola Andras

“People frequently ask how much land they need for self-sufficiency. The answer is ‘as much as you can control’. Any more and you loose self-sufficiency. Let alone the ability to produce an excess. If people ask, ‘Where do I start?’ then the answer is always ‘At your doorstep’.” Bill Mollison

BIOREGION

Sipapu is a 160-acre parcel of primary and secondary rainforest in the Tambopata Nature Reserve Buffer Zone, 4 hours from Puerto Maldonado in the Peruvian Amazon.

The climate in the Tambopata region is Tropical Rainforest. By definition:

“a tropical rainforest climate, also known as an equatorial climate, is a tropical climate usually (but not always) found along the equator. Tropical rainforest climate is a type of tropical climate in which there is no dry season... Tropical rainforest climates have no pronounced summer or winter; it is typically hot and wet throughout the year and rainfall is both heavy and frequent. One day in an equatorial climate can be very similar to the next, while the change in temperature
between day and night may be larger than the average change in temperature between "summer" and "winter".\textsuperscript{40}

TEMPERATURE AND RAINFALL

The most rain falls during January and the least rain falls in July. People living in Sipapu and its area noticed that before every fool moon a storm travels through the land it brings stronger winds and higher precipitation. The wind normally blows from North East and the clouds are coming from West.

"The annual mean temperature in the area is 26 °C, with a range between 10° and 38 °C. The lower temperatures are caused by cold winds of Antarctic origin; these cold waves occur in June and July." \textsuperscript{41}

ECO-LODGES

The Tambopata area is famous for eco-tourism, with a number of well-established ecolodges in operation. Eco-lodges

"focuses on minimizing the negative effect lodging has on the environment, while positively contributing to local communities and/or conservation efforts... on using renewable energy sources, efficient lighting and water preservation, recycling and reusing in order to positively impact the environment." Ibid.

As observed already, the eco-lodge industry in the Tambopata has tended so far towards the luxury end of the market, where green credentials tend to be compromised by hidden costs in the supply chain. Sipapu is part of a new generation of sustainable visitor/participant projects that able to learn from foregoing mistakes and new awareness of social and economic imbalances and make the necessary adjustments.

Indeed, one major question all human interventions in the rainforest must answer is whether they do more good than harm.

\textsuperscript{40} waterbase.com
\textsuperscript{41} Wikipedia
“Since they are often located in remote areas, eco-lodges tend to depend heavily on the surrounding environments.”

Ways in which Sipapu may achieve positive ecological impact as well as sustainability, both key to achieving its vision and mission, is described in the following sections. General discussion identifies positive opportunities for ecotourism, if handled in the right way.

“Tourism dollars allow local communities to remain on their native land, without stripping away its precious natural resources. This not only has a positive effect on the environment, but the increased economic benefit to the communities also allows them to better control the future of their culture.”

And for the visitor:

“Staying in an eco-lodge helps connect one more with the natural environment. Many eco lodges focus on preserving their surrounding environments, bringing awareness to nature, and helping to conserve wildlife. In many remote areas around the world, eco lodges are located close to indigenous tribes that have long inhabited the areas. Through eco lodges, travellers are educated about their surrounding natural environments, the local people who rely on living off the land, and about the flora and fauna of the surrounding regions. Many eco lodges will help to connect travellers with the local inhabitants, who in turn are positively impacted by these interactions. Both travellers and the locals are rewarded through learning about each other’s customs and traditions.”

The luxury eco-lodge treads a fine line. Economic inequality between guests and staff belies other inequalities across all four of the dimensions of this report.

Sipapu implements whole-system thinking to take account of relationships with local communities as well as the visitor experience. This section of the report outlines the ecological dimension of that thinking.

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42 Emma Balmforth’s Blog
SIPAPU NOW

BASICS
At the moment life at Sipapu is dependent upon regular visits by boat from Puerto Maldonado (4 hours upriver), bringing provisions, water and fuel for the generator.

Sipapu relies on fossil fuel for transport and electricity generation. Navigating the river is a specialist skill, requiring years of training and practice. During the rainy season, it can be hazardous due to higher volumes of driftwood, in drier months due to sandbars.

Sipapu has access to fresh water, from the river, from rainfall and from subterranean aquifer. At the moment river water is pumped through a sand tank to provide washing water. There is no drinking water solution on site, and water is brought from town in large, reusable plastic tanks.

CLIMATE
Challenging weather occurs on a regular basis, particularly in the rainy season (December to March), which sees frequent flooding from rainfall and swollen rivers.

River and rainfall are tough on infrastructure, which tends to be wooden. Constant maintenance is required, with staircases and jetties being swept away annually. New moon swells of rain relate to larger patterns, like those of El Nino.

Longer term still, the Amazon plain is thought to be drying out43. No doubt there will be a few surprises in store, as system interdependencies unique to the Amazon are

43 NASA Amazon Climate Study 2019
revealed by climate change and its endless consequences and corollaries. As a safety measure, Sipapu is positioning all future buildings further from the river.

**PHYSICAL ASSETS**

Up to 20 people can currently be accommodated. Dormitory, kitchen and dining house, ceremonial house with flushing toilet and shower, two compost toilets, water tower, caretaker’s house and covered walkways between some of the main spaces. The buildings and timbers are generally well maintained. All thatched roofs were replaced in Q1 2019 with zinc ones, and the guardian’s house completed renovated.

The original Sipapu boat was 5 years old at the time of purchase, towards the end of its lifespan. A new, fibre-glass hull has been bought, at the advice of Vito, Sipapu’s manager and default riverboat captain. The new boat is lighter and longer lasting, and delivers better fuel economy.

A short walk from the riverside buildings lies the “ceremonial field’ where the Temple will be built on high ground (about 10–20m higher than the local average).

**LIVING ASSETS**

Living assets include:

- Banana plantation (0.1 ha);
- Citrus, mandarin, araza, copoazu, cocoa, guaba or pacae and avocado (0.2 ha);
- Some agroforestry areas;
- Primary forest with trees such as lupuna and shihuahuaco surpassing 35 m, chestnut trees (“castaños” or brazil nut) that surpass 45m in height. Approximately 40 brazil nut trees are in place, with an average annual production of nuts (in shell) of 40 kilos per tree.

**DESIGN SUMMARY**

This section explores how the project meets ecological challenges, including solutions to issues facing humanity today, like climate change, sustainability, pollution, deforestation, increased carbon footprint, biodiversity and waste management.

Sipapu aims to minimise its ecological footprint by:

- **Living in balance with its habitat**
- **Minimal disturbance**
- **Closed loop systems of waste and water**
- **Sustainable farming and forestry practices**
- **Reducing carbon footprint via renewable energy, local building materials, energy usage policies, low or zero waste generation.**
CLIMATE CHANGE RESILIENCE

Development Phase 1 of 3 of the project provides a sustainable foundation from which to launch Phases 2 and 3. It’s about going from low to zero environmental impact, closing basic loops, and establishing the basics of off-grid sustainability.

This report summarises findings from a variety of permaculture perspectives, in anticipating project goals including:

- functioning food forest, fruit and veg gardens
- closed loop water system
- low impact buildings
- renewable energy
- sustainable waste management.

KEY PRINCIPLES

“Permaculture combines three key aspects (inner circle):

1. An ethical framework
2. Understandings of how nature works
3. A design approach.

The combination provides an ethical framework to design regenerative systems from home and garden to community, farm and bioregion.

The word 'permaculture' comes from 'permanent agriculture' and 'permanent culture' - it is about living lightly on the planet and making sure we can sustain human activities for many generations to come.

Permanence is not about everything staying the same. It is about stability, about deepening soils and cleaner water, thriving communities in self-reliant regions, biodiverse agriculture, and social justice, peace and abundance.”

“The ethics earth care, people care and fair share form the foundation for permaculture design and are also found in most traditional societies. Ethics are culturally evolved mechanisms that regulate self-interest, giving us a better

44 permaculture.org.uk
understanding of good and bad outcomes. The greater the power of humans, the more critical ethics become for long-term cultural and biological survival.

Permaculture ethics are distilled from research into community ethics, learning from cultures that have existed in relative balance with their environment for much longer than more recent civilisations. This does not mean that we should ignore the great teachings of modern times, but in the transition to a sustainable future, we need to consider values and concepts outside the current social norm.”

Permaculture at Sipapu includes these ethics alongside with learning local agriculture wisdom and plant use and integrating those harmoniously with other technologies and knowledge for the same aim.

**EARTH CARE**
Sipapu will minimalize disturbance to the land; to find pesticide free solutions; to encourage wildlife balance; to grow medicinal plants, trade crops or building materials (ex. bamboo) on a sustainable way and provide its energy using renewable energy sources.

**PEOPLE CARE**
By providing comfortable, clean and safe homes for permanent or temporary residents (Health & Safety Measures); cooking and serving healthy food every day - preferably organic and locally grow; clean water and sanitation also Sipapu wants to organise spiritual rituals that heals the soul, body & mind (Shamanic Retreats).

**FAIR SHARE**
Sipapu will share resources, food and knowledge with the local community through reciprocity; share the land fairly with other living creatures and create abundance in a finite environment.

“Nature abounds with examples of beneficial relationships.”
*Permaculture Design – A step by step guide by Aranya*

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45 [permacultureprinciples.com](http://permacultureprinciples.com)
SECTOR ANALYSIS

Figure 30 Sector Analysis for sun, wind, flooding and fire.

Sector Analysis identifies elements and forces of Nature external to Sipapu.

THE SUN
Knowing the Sun’s path, wind routes, possible flooding areas and fire hazards, we can devise strategies to harvest energy, build fertility and yields, and divert or reduce unwanted energies.

Most of the land is forest. In order to gain more sunshine for crops and energy harvest, and gain space for building, some tree clearance may be necessary. Mapping the Sun is important. Sipapu is located between the Equator and the Tropic of Capricorn where the Sun’s position is high above the land regardless of wet or dry season. Clouds from the West may impact energy harvest from the Sun.

WIND & FIRE
Prevailing winds reach the site from the North East, which could spread fire from neighbouring areas where crop burning may occur. Hazardous fires have not been reported in the area, however smoke from fires in Brazil and Bolivia this year reached the Tambopata.

FLOODING
The southern border of the land n the river is most likely to flood. Rainy season levels have been known to reach the ceremonial house.

Damage to river dock and stairs is expected annually. Maximum rainfall varies with the 7 year El Niño cycle. Due to their traditional design, raised on stilts, there is little water damage to buildings.
ZONES

Zoning in Permaculture helps to understand the energy used by people throughout the land and to plan accordingly.

First we map activity patterns to see which areas are used the most and which areas are used the least.

The goal is to find greater energy efficiency as we add more buildings and functional areas to the land. Zoning navigates us in the design process to find the best possible location for each required activity. Zone 0 for example represents the most used areas and as we go further towards Zone 5 the energy required at each zone will decrease.

SIPAPU ZONES

The GAIA Education team mapped zones in detail for **Phase 1** of the project’s proposed development. See the *Phase Map* overleaf for a breakdown of the three development phases.

| **ZONE 0** | People | Staff
|-----------|---------|---------
|           |         | Residents
|           |         | Students
|           |         | Visitors
| **ZONE 1** | Frequent/flexible use | Dormitory, kitchen, ceremonial house, facilitator house, sanitation block, walkways, guardian house
| **ZONE 2** | Frequent use | Kitchen garden
|           |         | Food garden
|           |         | Social spaces
|           |         | Rainwater harvesting outlets
| **ZONE 3** | Regular visits | Ceremonial field (Phase 1)
|           |         | Temple (Phase 3)
|           |         | Agro-forestry plantations
|           |         | Composting areas

Illustration: Fehre Müller | Source: www.zukunft-liebenmachen.de | Licence: CC BY-SA 4.0
While Sector Analysis maps the routes of outer energies, Zoning maps inner energies involved in human flow around Sipapu. The zone map forms a key input into further refinement of the site plan as it evolves and develops.

The following ecological sections of the report address Phase 1 in detail.

OVERLEAF: Blueprint of Development Phases >
WATER SUPPLY DESIGN

To be able to create water harvesting & purification and sewage treatment systems we must understand first how the water flows through the site. There are three ways as such: from the sky, from the river, and underground.

Water is currently drawn from the river via electrical pump, first to a sand filtration tank, then to a raised storage tank, which supplies the shower and flushing toilet in the ceremonial house, and the kitchen and toilet block taps. Phase 1 will move the water tower 50-100m further back from the river.

FROM THE SKY
Water is abundant due to high rainfall all year round. The rainy season is between November and April (highest precipitation in January) and the dry season is from May to October (least precipitation in July). Annual average rainfall is 53.14” (1350mm).

Zinc roofs on current buildings facilitate harvesting rainwater. We estimate total roof area at 400m² or 4305.56 ft².

\[
\text{Harvested Water (Gal)} = \text{Catchment Area (ft}^2) \times \text{Rainfall Depth (inch)} \times \text{Conversion Factor (0.623)} \\
= 4305.56 \times 53.14 \times 0.623 \\
= 142,513 \text{ gallons/year (647,881.42L)}
\]

FROM THE RIVER
Sand-filtered river water is used for toilet, showers, cooking and laundry. Drinking water and water for cooking is transported from Puerto Maldonado. Sourcing clean water for the site currently is costly and environmentally damaging due to the petrol used for the boat also the amount of plastic that reaches the site. Recycling plastic is possible in Puerto Maldonado that means another trip to the city by boat. River water requires treatment before drinking.

AQUIFER
The site has a borehole, which will require fitting with a pump to draw water. Further research is required on site to accurately evaluate using this method of sourcing water.

WATER PURIFICATION
The project is discussing whether an innovative water purification system made by Australian not-for-profit F-Cubed, can be adapted for rainwater harvesting.

The F-Cubed solution uses solar-voltaic cells both to harvest energy and power a purification system capable of eliminating harmful bacteria and parasites, and even desalinating water ready for drinking.

Source water passes across the collection surface, where it is treated, with fresh, drinkable water being output to tap. The system should be installed beside the buildings where rainwater can be diverted onto the panels. As the water travels through the panels it will be purified using the Sun’s heat and energy. Excess rainwater will be kept
in storage tanks and when needed divert back up to the top of the panels for further purification.46

WASTE TREATMENT
Currently there are two compost toilets, two flushing toilets and one shower that black water is released into the river. In Phase 1 the focus will be on improving the existing compost toilets. The very first step is to move them at a greater distance from the kitchen then make them aesthetically more appealing for the visitors. This will include odour elimination through adding other ingredients as well next to the sawdust.

BIOCHAR
Biochar Composting Toilets decompose humanure, charcoal and other organic matter such as dried leaf, saw dust, nutshells, producing fertile compost that can be used as agro-forestry mulch.

Biochar or Tera Preta is a well-known technique used for fertilizing soil in the Amazon. It owes its characteristic black colour to its weathered charcoal content.

A product of indigenous soil management and slash-and-char agriculture, the charcoal is stable and remains in the soil for thousands of years, sequestering carbon, binding soil and retaining microbes, minerals and nutrients.47

Manure from compost toilets is currently released into the forest. In the future it will arrive at dedicated compost piles to begin biochar composting.

BLACK WATER PROCESSING
Flushing toilets are located in the Ceremony house and Guardian's house. Wastewater is simply released into the river untreated. Clearly, this is not sustainable. We propose to install a septic tank with “French drain.” 48

Wastewater from toilets will arrive at the tank, where the solids settle and begin decomposition. There is an option here for a biogas digester to collect methane. Wastewater outflow from the tank will filter downhill through the bamboo plantations, which provide root system filtration, and take-up of nitrous substances for growth.

46 F Cubed
47 Wikipedia
48 diydoctor.org.uk
Sipapu must use natural cleaning products (vinegar, soda bicarbonate, etc.) in order not to negatively impact microbial decomposition in the septic tank. The tank will need to be emptied of solids annually. These decomposed solids are safe to be applied to outer (Zone 3+) agro-forestry areas. Precise location and layout of trenches and underground pipes will happen on site Phase 1.

![Septic Tank Diagram](image)

**Figure 32 Septic tank construction**

The Sanitation block built in Phase 2 due to have at least two flushing toilets together with two showers that black water will be collected in septic tanks and purified through a septic drain field. “Septic drain fields, also called leach fields or leach drains, are subsurface wastewater disposal facilities used to remove contaminants and impurities from the liquid that emerges after anaerobic digestion in a septic tank.

Organic materials in the liquid are catabolized by a microbial ecosystem. A septic drain field, along with a septic tank, and associated piping compose a septic system. The drain field typically consists of an arrangement of trenches containing perforated pipes and porous material (often gravel) covered by a layer of soil to prevent animals (and surface runoff) from reaching the wastewater distributed within those trenches.

Primary design considerations are both hydraulic for the volume of wastewater requiring disposal and catabolic for the long-term biochemical oxygen demand of that wastewater.\(^{49}\) The drain field will be built towards the bamboo field and will act as a nutrient feeder for the bamboos. In order to keep constant flow of the system regular clearance is advised.

Clean water for the toilets and for the showers will be supplied from the rainwater harvesting and treatment system build in Phase 1.

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\(^{49}\) Wikipedia
FLOOD RESILIENCY

During the rainy season the lower part of the land is at risk of flood. Care will be taken in detailed site planning to locate buildings and septic tank outside risk areas.

GREEN BUILDING GUIDELINES

New buildings in Phase 1 include:

- Facilitator's house
- Sanitation block
- Water tower
- Sheds near food gardens.

Like the existing buildings, they are built from wood in Amazonian vernacular, with tall roofs for ventilation, surfaced in corrugated zinc for durability.

The new buildings will form a bridge from the current riverside dwellings, to Phase 2’s Eco-village, sited 50–100m northwards, to provide better flood resilience.

Phase 2, the project team are exploring options for collaboration and co-promotion with a number of green building start-ups, including Geoship.Is, an Icelandic company set to manufacture domestic geodesic domes from BioCeramic, an inert and carbon-neutral material up-cycled from industrial waste products. Key considerations include solar panel integration, ventilation and cost per unit.

BAMBOO

While wood is the go-to default in the Amazon, it is generally limited to a 5–10 year lifespan due to the high humidity and burrowing insect population.

Bamboo is being evaluated as an alternative construction material. Sipapu staff attended a local workshop in October 2019, curated by Peru and Amazon-wide not-for-profit Children Bamboo, who are promoting bamboo for its use in construction.
BIOGAS
Phase 1 will install a biogas digester for kitchen use.

“Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste. Due to the high content of methane in biogas, it is flammable, produces a deep blue flame, and can be used as an energy source.”

Organic matter is digested producing gas and rich liquid fertilizer. The gas will be used for cooking, the liquid fertilizer for the veggie garden. Surplus gas will be stored in cylinders.

Biogas reduces fossil fuel usage. For cooking there is no need to transport gas cylinders from Puerto Maldonado. Also the anaerobic digestive system provides sustainable food waste disposal.

SHARED SPACES, SHARED RESOURCES
Private and communal spaces are key to community health. People must have privacy and space for me-time, groups must have space to gather, eat, talk and celebrate.

Sipapu’s main income throughout Phases 1 and 2 will be via retreats and residential training programmes, wherein, due to the teacher-pupil nature of some of the work it is good practice to plan for a space boundary between facilitators and students.

Phase 1 includes a new house, providing private space for facilitators. Shared spaces include the kitchen and dining house, ceremonial house, and recreational areas like verandas and gardens.

Common resources like information, electrical outlets and drinking water are provided in these shared spaces. All meals are shared, which generates community spirit, and allows energy resources like night-time lighting, to be conserved in one space.

Phase 1 will introduce the first, centralised Solar PVC system, likely using the roof of the largest building, the dormitory house, to house the panels.

Phase 2 will introduce a subsequent system(s) scaled with the modular development of the eco-village.

GENERAL WASTE MANAGEMENT
Visitors will be encouraged to leave no trace. The site has dedicated stations for collecting and managing waste. Food waste will be recycled in the kitchen. Residents and visitors will use natural products with zero or compostable packaging.

50 homebiogas.com
FOOD & GARDEN WASTE

“Nature creates no waste; it is a genuine human invention. In nature nothing and nobody goes to waste because the definition of an ecosystem is a system of cooperative and symbiotic relationships; the discards of a process are the input for another one. Everything is upcycled into the system so that the system is sustainable and resilient. In an ecosystem all energy used is renewable and non-polluting and all resources are obtained in the vicinity using non-extractive, low-energy-intensive techniques”\textsuperscript{51}.

At Sipapu to develop a cooperative and symbiotic relationship with nature a biogas digestive system will be built where all the cooked leftover food, expired processed food, animal bones, etc. will be added for decomposition. As mentioned earlier the gas created through the process will be diverted back to the kitchen for cooking purposes and the liquid fertilizer will be released in the veg garden to provide nutrients to the plants.

Kitchen scraps or other leftovers that has not been cooked yet and is no longer good for human use will be added to the cold compost pile. The compost will be located in the Zone 2 and built accordingly to avoid unwanted pets visit. The rich material that will originate from the decomposition of organic materials then it will be added to the soil in the veg garden (or whenever is necessary) to encourage healthy plant growth.

Benefits of using these methods and mimicking the natures cycle are: no human waste will be created that can destroy the habitat; it reduces methane gas emission to the atmosphere; regenerates soil conditions; restrains water in the soil, etc.

ADDITIONAL MEASURES

Phase 1 will implement the following resource-saving guidelines. An adaptation of this list for residents and visitors will be displayed online and on-site.

Energy

- Lights out at 11pm
- Switch lights and appliances off when leaving a room
- Charge phones and devices only during the day
- Use of appliances during the day only where possible
- All light bulbs to be LED
- All appliances to be of high energy rating AA or above.
- No appliances to be left on standby.
- Make sure fridge/freezer door(s) is (are) shut tight.
- Make sure all electrical equipment is regularly checked and maintained/serviced accordingly

\textsuperscript{51} zerowasteeurope.eu
Water

- Turn tap off while brushing teeth
- Be water efficient when washing up, i.e. use a basin and do not leave tap running.
- Be sensible and considerate with shower duration
- Fit water-saving shower heads and taps
- Fix leakages as soon as possible.

Refuse

- Sipapu aims to be a no-landfill site.
- Only materials that can be composted and/or efficiently recycled
- No single-use items.

Toiletries

- No chemicals used on site
- 100% natural and environmentally friendly only
- No products containing micro-beads
- Cosmetic/hygiene products to be environmentally friendly.
- Due to our water treatment systems we are unable to wash clothes made of synthetic fibres on site.
CARBON NEUTRAL ENERGY DESIGN

SOLAR
Sipapu will be completely energy self-sufficient by building an Island grid on site. To find the best possible solution a detailed analysis has been made that shows the benefits of generating energy via solar energy system rather than fossil fuelled generator.

ISLAND GRIDS
Island grids contain a single, or a number of power generating plants and consumers to provide an electrical task. They do not have a connection to a mainstream utility network and therefore have to be able to provide all electrical demands necessary to any site’s operation at any time.

Worst case scenarios include limitations in available fuel, traditional or green, the relative serviceability of the generating set(s), economic, and environmental impacts, (to include supplying the site with a fuel) as well as the peak electrical demand at any one time, but also on average taking into account seasonal variation of the supply of energy, and its limitations, as well as seasonal variation in the demand in power.

The biggest challenge when designing an island grid is to maintain a balance between production and consumption. Traditional fuelled generators are frequently used for this task, and this is often due to the convenience of accessing and storing high density fuels such as diesel and LPG, and the availability of fossil fuelled generators and their ease of servicing.

Renewable energies are often interconnected via programmable logic-based systems. These have complex control structures, making their behaviour more amenable to automated system programming and less dependent on physical intervention.

Sipapu will employ a renewable energy island grid at its minimal extent and will monitor in real time, using a traditional fuel generator to facilitate the required uptime of service, backing up the initial renewable energy.

The recent evolution of equipment and methodology that now is in use in island grid development means systems are completely modular. Battery storage can be expanded as and when, as can the island grid peak output capacity, green generators such as solar can be increased as the demand grows, or when it comes to negate the previously employed traditional fuel generator based on the real time demand being viewed.

A general rule of thumb is that a diesel generator will use 0.4 L of diesel per kWh produced

Every litre of fuel has 0.73 kg of pure carbon, 2.6 kg of carbon dioxide released per litre of diesel fuel.
ECOSYSTEM ANALYSIS

For the following analysis we have not included heating and cooling aspects, it is noted that electrically powered ceiling fans will offer passive cooling to internal spaces.

NASA Prediction of Worldwide Energy Resource (POWER)
Higher Resolution Daily Time Series 1/2 x 1/2 degree
Climatology Resource for SSE-Renewable Energy

Data sets values are always to be cross referenced with onsite observations

Latitude: -12.8183 / Longitude: -69.3247
Time Extent:
22 Year Solar Climatological Averages (Jul 1983 - Jun 2005)
30 Year Meteorology Climatological Averages (Jan 1984 - Dec 2013)
Elevation: 238.43 meters

Wind generators are deemed unsuitable at this location due to the extensive canopy coverage and low average mean wind speeds <1 m/s at 10 metres agl, 1.84 – 2.21 m/s at 50m agl

Detailed environmental factors used in our calculations can be found in Appendix 6.

CLOUDS

Diurnal cloud information along with optimum azimuth and tilt angles can then be inputted into the modelling platform to offer Solar photovoltaic sizing.

The effects of shading must be considered when positioning the solar PV array. The extensive canopy has the potential to shade part or all of the array during the solar cycle, an analysis of shading is not possible reliably in a theoretical analysis and observations must be taken on site to assess adequate clearance of brush and foliage to create a “window” of optimum solar gain.

POWER MANAGEMENT

Victron Energy equipment provides island grid inverters, charging, solar control and monitoring. Internet connectivity enables remote viewing and control, together with real-time system optimisation. Peruvian electricity arrives at 220v and 60Hz. The UK’s is at 240v and 50Hz. An island grid will service both ratios. US visitors will need a step-down transformer.

LOAD PROFILE

The following load profile anticipates 20 people on site, providing a workable mean for Phase 1 stays at Sipapu. Assumptions have been made regards electrical appliance demands in the model.

1. Fridge / Freezer 300kWh /year - 0.821 kWh /day
2. Water delivery pumping to head height of 6M ~2.4m3 total water production per day on average 2kWh /day
a. See separate analysis using a variable speed solar direct to pump driven pumping system as a viable alternative. (500W solar)

3. 10 lighting outlets in total assuming LED Bulbs used for the following areas 4W ea. For 6 hours. \textbf{0.240 kWh / day}
   a. bungalow,
   b. dining room,
   c. kitchen,
   d. bedroom,
   e. bathroom/dining room/kitchen,
   f. guards house,
   g. utility shed – (generator house, proposed plant room)
   h. Provision for security light,
   i. (adaption of path lighting is with individual solar lanterns that aid aesthetics and safety).

4. Power demand for a typical 230 Vac 4 bladed Ceiling fans (8 required for 6 hours per day) \textbf{2.16 kWh / day}
   i. Specified by manufacture for use in rooms up to 15m²
   ii. Motor (mm): 153 x 10
   iii. RPM (H/M/L): 210/145/85
   iv. Watts (H/M/L): 45/32/23

5. Charging for mobile phones / cameras \textbf{1 kWh / day}

6. Satellite internet connection \textbf{1.44 kWh / day}

Total daily demand 7.66 kWh / day. Average base load design specification 0.319 kW

Data used are those available online for Tambopata Province.

Inputting the above data into our model we can display theoretical performance indicators of a solar PV based system running the load profile detailed above.

We show this in an extract of our platform in the tables below.

- **Generation** = Daily kWh production
- **Exc. Ave** = excess renewable energy generated on average in percentage
- **Exc kWh** = excess renewable energy generated on average in kWh
- **Usage** = Day/Month kWh
- **Day Ahr** = usage in Amp hours relative to system battery voltage
- **Relative energy demand** = shows demand which includes losses seen though battery
- **Mth gen for load** = kWhs required to provide load when renewable energy is not present
- **For batt recharge** = energy required to cover losses through battery
- **Generator fuel cost only** (without servicing)
Day amp hour required for this model is set for a 48Vdc Battery. We can use this value to attain a level of autonomy considering our dark day scenario above. At certain points in the year we see a potential dark day scenario of 6 days. In real terms in may not be economically acceptable to build a battery to sustain the load for this worst-case scenario. Though, it is observable to where a back-up generator may be required to cover these periods.

The above model is designed for Lead Acid (LA) batteries. Lead Acid technology requires 3 stage charging. The second stage is the absorption stage, whereby a battery has to be charged for 6-8 hours at an incrementally lower current to become fully charged. Think of it as pressurising the battery. For this reason, solar needs to be over sized to allow this process to happen on a regular basis. Or have provision for a traditional fuelled generator to provide this service. LA batteries require this “pressurisation” every two weeks as a rule of thumb in order to fully maintain this battery type.

A typical economic profile of a battery designed to support the load for 4-5 days without charging support would look as follows:

<table>
<thead>
<tr>
<th>Sys. Vdc</th>
<th>Unit #</th>
<th>Battery</th>
<th>Unrate kWh</th>
<th>Ah ClD</th>
<th>Cycles</th>
<th>Cost</th>
<th>Life Span</th>
<th>Life Cap. kWh</th>
<th>$ per kWh</th>
<th>$ per KWhr</th>
<th>$ per KWhhr</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>10</td>
<td>AGM S.C. 12V</td>
<td>19.8</td>
<td>1150</td>
<td>850</td>
<td>£3,150</td>
<td>4.20</td>
<td>11730</td>
<td>£0.27</td>
<td>£0.30</td>
<td>£0.35</td>
</tr>
<tr>
<td>24</td>
<td>10</td>
<td>NSB blue 12V</td>
<td>12.0</td>
<td>1000</td>
<td>2050</td>
<td>£4,179</td>
<td>8.80</td>
<td>24000</td>
<td>£0.17</td>
<td>£0.19</td>
<td>£0.22</td>
</tr>
<tr>
<td>48</td>
<td>24</td>
<td>Victron GEL 2V</td>
<td>12.0</td>
<td>500</td>
<td>2500</td>
<td>£7,421</td>
<td>10.74</td>
<td>30000</td>
<td>£0.25</td>
<td>£0.27</td>
<td>£0.32</td>
</tr>
<tr>
<td>48</td>
<td>24</td>
<td>OpzS Gel 2V</td>
<td>12.0</td>
<td>500</td>
<td>2500</td>
<td>£4,752</td>
<td>10.74</td>
<td>30000</td>
<td>£0.18</td>
<td>£0.17</td>
<td>£0.21</td>
</tr>
</tbody>
</table>

OpZs Lead Acid technology offers the most economical solution at the lowest cost /kWh overall and greatest lifespan.

The lifespan of Lead Acid batteries can be extended by increasing the installed capacity, and therefore reducing the cycling.

Temperature can have adverse effects on Lead Acid batteries. Higher ambient temperatures reduce the capacity and shortens lifespan (comprehensive information of battery types and function can be found in our other documentation)

Unlike Lithium Battery technology, Lead Acid batteries cannot be added to later on. An old battery will be the common denominator in any bank. Adding new to old will
restrict and reduce the functionality of the new cells added. A modular approach to capacity is limited to Lithium technology.

Longevity of a system is important in initial system designs. Capex can be reduced using smaller, and lower standard battery cells. Though any long-term project should look at the costs of the battery over its projected lifespan to determine its suitability.

A similarly sized Lithium phosphate technology (LiFePO4) shows the following economics:

![Economics Table]

Although our “BYD B-BOX 13.8” example shows only slightly better economics, its lifespan is almost double that of OPzS in this example.

The other significant benefit with LiFePO4 technology is the efficiency of the battery. Now at 96% efficient, systems can be designed with much smaller battery sets, as the recharge and discharge rates are significantly higher. The entire capacity of the battery can be used, and the lengthy absorption phase detailed in the lead acid example above is not required, allowing a greater extent of solar energy to be utilised for on-site demands, and/or much lower traditional fuel use to maintain a stable grid.

LiFePO4 technology can also be evolved and expanded as the sites needs grow. If we were to employ a ground mount ~3kWp solar PV array to this load profile using Lead Acid Batteries we may see the following, very positive results.

![Solar PV Results Table]

An overall positive excess amount of solar energy vs load with a much-reduced fuel cost.

If we adjust the profile to suit LiFePO4 technology we negate the need for the traditional fuelled generator, providing a fully sustainable Island grid. The traditional generator held only for extended dark periods, and to be held as an emergency back up.
Necessity of real time, and also historical monitoring to better understand the workings of the natural resources, traditional resources and dynamic load profiles create a more efficient working system overall. Using pumps when the sun is out for example.

**SOLAR SYSTEM WITH LEAD ACID BATTERY STORAGE**

- Inverter charger with monitoring panel: £1,386.75 + VAT
- 2.2 kWP ground mount PV: £1,395 + VAT
  (8x275W solar panels, 2x 4-panel ground mount)
- Battery monitor (if low voltage DC required): £96 + VAT
- Lead Acid batteries: TBC
- Cables, distribution, protection etc.: TBC

**SOLAR SYSTEM WITH LITHIUM BATTERY STORAGE**

- Inverter charger with monitoring panel: £1,386.75 + VAT
- 3.3 kWP ground mount PV: £2,092.50 + VAT
  (12x275W solar panels, 3 x 4-panel ground mount)
- Battery monitor (if low voltage DC required): £96 + VAT
- LiFEPO4 batteries see prices in table above: TBC
- Cables, distribution, protection etc.: TBC
A 48V system has been specified in both instances above for the following reasons:

- more efficient
- more cost-effective lithium battery options.

Although considerations on site for a low-power charging (typically 12V) i.e. low voltage lighting, are common practice due to familiarity and availability of products, 12V mono block batteries are more expensive with shorter life spans (please refer to top two rows of lead acid batteries table).

If 12V was required on site, it would be cheaper and more efficient to use a dc to dc converter.

Lithium batteries are the preferred option because they offer extended lifetime, warranty and capacity. Lithium batteries would be a lot more efficient in higher ambient temperatures; the optimum operating temperature for lead acid battery is 25C, for every 8C above this, the battery life is reduced by half (guideline).

The 48V lithium system is expandable, simply add system again to double everything. Systems based on lead acid batteries cannot be expanded.

In both systems (lead acid and lithium) the lifespan of the batteries will be optimised if loads are used widely, meaning that ideally loads should be run during the day as much as possible, while the solar panels are generating, and keep the night time draw from the batteries to an absolute minimum. If loads are provided from solar direct, this will reduce the cycling of the batteries, therefore prolonging their lives.

Both system options come with remote monitoring and link up to an online portal showing historical, generation and usage values, which can be used to enhance the system, and expand/improve the design at a later date.

LIFESPAN AND RECYCLING
Solar panels come with 10-15 year guarantee and 20-25 output guarantee of up to 80-90%. It isn't uncommon for panels to be in use 40 years after installation. Should the panels need replacing after the end of the warranty period, there are recycling schemes in place, so they do not end up in landfills.

Most European PV manufacturers are part of the global PV CYCLE network and all producers fall under the Waste Electrical and Electronic Equipment recycling (WEEE) legislation. This ensures commitment to a sustainable product throughout its lifecycle.

RECYCLING BATTERIES
Lead acid: not accepted in landfills and therefore recycled. The plastic casing is widely recyclable, and the lead goes on to make up new batteries. The acid can also be reclaimed and used in other products. 52

52 sarrecycle.com
Lithium Ion Phosphate (LiFePO4, LFP): unlike other lithium batteries where the main element is valuable cobalt or nickel, phosphate has little to no value which therefore makes recycling uneconomical. Lithium only makes up a small proportion of the battery and is also relatively cheap (compared to cobalt), therefore the cost of recycling it can remain prohibitive (even though it is 100% recyclable).

Environmental laws (e.g. Waste Batteries and Accumulators Regulations 2009 in the UK) require manufacturers to recycle batteries.

Due to the increase in electric vehicles worldwide, recycling lithium will be increasingly important. Some Chinese manufacturers are building their own recycling facilities.

Advancement in the recycling of lithium batteries continues and is increasingly seen as key to the sustainability of the solar PVC electricity industry. It can reasonably be assumed that by the end of their useful lives, efficient and environmentally friendly recycling processes for batteries installed at Sipapu will be operational and proven.53

CONTROL EQUIPMENT
Comes with 5–10 year warranty. Frames are mostly made of metal, which is widely recycled. Other components include plastic (also widely recycled) and electronic components such as capacitors, resistors, circuit boards, etc.

As with solar panels, due to the numerous amounts of different materials, the recycling of such components must be done by a dedicated facility (in Europe it would be classed as e-waste under the WEEE legislation). Such facilities probably do not exist in the region of Sipapu, however it can be reasonably expected that in 10 years, when the components’ lifecycle would start to be on the decline, such facilities would have become more commonly found throughout the country, making the recycling of such components a lot more accessible.

Electrical cables are widely recyclable.

BIOFUEL FOR TRANSPORT
The only way to bring people, food, fuel and drinking to Sipapu is by boat. A return journey requires 65–80 gallons of petrol (about $50). As the site becomes self-sufficient in food and energy, and patterns of residency are established, frequency of journeys will reduce.

There could be a weekly “changeover day,” requiring visitors to be ready to head upriver on a specific day, expect to be back on the same day a week later, and thus be able to plan regional and international travel accordingly.

A more sustainable boat service would run on biodiesel.

- Cheaper than fossil fuel
- No modification to propulsion system needed
  (usually a blend is used of up to 20% biodiesel with petroleum diesel)
- Sustainable, safe to use
  (Side products are fatty acid methyl esters)
- Can be homemade using by-products/waste etc
- Biodegradable

The boat will be visitor’s first contact with Sipapu. As an extension, the boat should hold to the same sustainability standards as the centre itself. Biogas conversion is well documented, this lending itself well to itemised and justified crowdfunding.
PERMACULTURE DESIGN

Sipapu will be a pioneer, combining local wisdom and modern innovation to:

- Maintain and improve soil fertility
- Maintain and improve ecosystem health
- Provide a healthy diet for residents & visitors
- Connect residents with the land
- Celebrate through food
- Ensure food security for the community
- Providing training for staff, participants and volunteers.

AGROFORESTRY

Current plantations form the basis of the agroforestry system.

“Trees or shrubs are grown around or among crops or pastureland. This intentional combination of agriculture and forestry has varied benefits, including increased biodiversity and reduced erosion. Increased productivity, economic benefits, and more diversity in the ecological goods and services provided.”

Due to lack of people on site during recent years, these systems are not optimised, nor fully integrated into other systems. Phase 1 addresses this directly, seeking to plant beans, corn and squash, or regional variants, as identified through detailed local bioregion consultation.

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54 Wikipedia
GARDENS
One Permaculture Principle is that energy input be less than output. This optimises system lifespan and maintenance.

“These systems, fuelled by the sun should produce not only for their own needs, but the needs of the people creating and controlling them. Thus, they are sustainable as they sustain both themselves and those who construct them.”55.

At Sipapu the vegetable and medicine garden will be created in Zone 1. As it will be the most used garden, the veg and medicinal crops will be planted closed to the kitchen area that will help to save energy while maintaining it.

Regarding food production it is vital to understand how different elements of the system relate to each other. It has been observed in the past that some of the plants if they are planted together are helping each other in growth while others compete for nutrients and are an attractive habitat for unwanted pests. Planting plants next that have beneficial relationship to each other is called companion planting.

Companion planting is one of the easiest ways to mimic a natural ecosystem, with multiple benefits:

- Save space
- Maintain soil
- Control weeds
- Manage pests through planting species
- Attract pollinators and helpful species
- Minimise or eliminate need for artificial pesticides or fertilizers

On site consultation is needed to determine optimum food and companion species. Local collaboration will aid the design process. Phase 2 gardens will provide sufficient yields of food to support sustainable residency.

FOREST CROPS
Sipapu has 47 Brazil Nut trees (Bertholletia excelsa). The unprocessed nuts fetch low prices ($1 for 20kg) on the wholesale market. Collecting and shelling the nuts is labour intensive, requiring specialist machinery at market production levels.

Brazil nut shells are used as ‘gravel’ on the pathways and riverbanks to combat mud and provide a neat security solution: walking on nutshells is noisy!

Dragon Blood, (Croton lecheri) and other medicinal plant/tree saplings will be planted in collaboration with the project’s Permaculture Partner, Camino Verde. The sap is tropical first aid (cuts, bites, burns, stings, etc.) Analog forestry methods will be followed.

“Analog forestry is a system of silviculture that seeks to design, plan and manage ecosystems dominated by woody perennials. (.) The design seeks to mimic the

55 “Energy and Permaculture” by David Holmgren
architectural structure and ecological function of the preexisting climax vegetation of the area, and can be designed to provide economic, social and environmental benefits."

**BAMBOO PLANTATION**

Phase 3 onwards, Sipapu will reduce carbon footprint by using natural building materials available on site. Bamboo is one of the fastest-growing resources on earth, and is a viable substitute for timber and tropical hardwoods.

"Unlike most timber, bamboo is a self-regenerating natural resource; new shoots that appear annually ensure future raw material after mature culms are harvested."

Phase 1 sees scoping and siting a bamboo plantation of 1–2 hectares, with saplings maturing into construction-ready poles in 4-5 years.

Closing the loop on water design, waste water and solid waste will supply nutrients to the bamboo field, which in turn filters waste prior to on-flow into the river system.

**PEOPLE POWER**

To sustain the workforce and provide food security for the community Sipapu will rely on the contribution of residents, visitors and volunteers, working to plans overseen by expert advisors like Robin van Loon, of Camino Verde, graduates of his programmes, or international permaculture students, graduates, instructors and leaders.

Sipapu will offer workshops in gardening methods, teach about the healing effects and utilization of medicinal plants, and be a place where people gather and celebrate life through shared meals with ingredients grown on site.

**PHASE SUMMARY**

**Phase 1** lays out a sustainable foundation for food, water, energy and accommodation, taking into account key ecosystem and bioregional variables like rainfall, temperature, soil type and site topography. Expected population 5–20.

**Phase 2** lays out an eco-village in crowd-funded, time-shared clusters of 4–8 domes or domiciles with zero carbon footprint. Estimated population 20–40.

**Phase 3** sees the construction and integration of the Temple itself, with resultant increase to resident and visitor population, perhaps up to a total of 100 people on site.

Inappropriate wastes such as petroleum products, chlorinated solvents, dissolved metals cannot be processed/removed by the microorganisms in the septic system.

Cleaning formulations may reduce drain field efficiency. Laundry bleach may slow or stop microbial activity in the drain field and sanitizing, or deodorizing chemicals may have similar effects.

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56 Wikipedia
57 plantationsinternational.com
Detergents, solvents and drain cleaners can transport emulsified, saponified or dissolved fats into the drain field before they can be catabolized into short-chain organic acids in the septic tank scum layer.

Careful consideration must be made as to which cleaning and personal hygiene products are used on site, as well as how water from cooking/washing is being disposed of.

To avoid any issues notes will be sent to visitors in advance to only bring and use products that are natural and biodegradable/compostable. Sipapu will also provide such products preferably made on site for purchase. Cleaning and disinfecting kitchen sinks, toilets, etc, vinegar is a great solution.

Following the patterns of Phase 1 all spaces will be powered by renewable energy through expanding the existing solar panel system or build a new one if it is necessary.

By Phase 3 Sipapu will include a self-sufficient and active eco-lodge.
DESIGN OUTCOMES

HIGH LEVEL SITE PLAN SHOWING PHASES
GOING FORWARDS

The project plans 3 development phases over the next 5–8 years, each building upon the systems and findings of foregoing work, including work completed by the previous owner, Don Oscar, to whom we owe the existence of the current, riverside buildings.

While this report anticipates all three future phases, it primarily deals with Phase 1, alongside regional and global factors. We may list the components of Phase 1 across all four dimensions as follows:

<table>
<thead>
<tr>
<th>ECOLOGICAL</th>
<th>ECONOMIC</th>
<th>SOCIAL</th>
<th>WORLDVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td>Impact</td>
<td>Governance</td>
<td>Perspectives</td>
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<tr>
<td>Renewable Energy</td>
<td>Resilience</td>
<td>Leadership</td>
<td>Narratives</td>
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<tr>
<td>Food security</td>
<td>Stakeholders</td>
<td>Community</td>
<td>Celebrations</td>
</tr>
<tr>
<td>Green building</td>
<td>Social enterprise</td>
<td>Scale linking</td>
<td>Outreach</td>
</tr>
<tr>
<td>Climate resilience</td>
<td>Business Planning</td>
<td></td>
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</tr>
</tbody>
</table>

Phase 1 is in many ways the most important phase. It introduces systems essential to sustain the project under development, and lays the foundations on which to develop phases 2 and 3. As the first phase, mistakes will be made, learnings will be taken forwards.

We hope to have shown how each dimension integrates inputs and outputs at respective levels, providing support for the project Objectives, Mission and Vision.

CONCLUSIONS

This report was written in 12 weeks, as the main and final submission of the GAIA Education Design for Sustainability course, November 2019. Of the Design Team, only the case study proposer and project director (Nizami) has attended Sipapu physically.

Ecological Dimension components of the design in particular would benefit from a site visit. Recommendations and guidelines will take further shape when they are applied in the field, and real learning in many practical disciplines and projects can only be from real mistakes.

Nizami missed the Economic Dimension presentations during 2019, due to being at Sipapu, which currently has no internet. The business structure and therefore business plan were only available from October 2019, following lengthy consultation with legal and business advisers. Details are still being worked out. Had it been available sooner, the team would have further developed synergies between ecological and economic dimensions, and perhaps made some high level business forecasts.
The team managed to elicit detailed information from Nizami, the project literature and a wide range of generalist and specialist references within and beyond the GAIA reading list, to consider a comprehensive set of factors essential to Sipapu’s success as a sustainable and regenerative community. The report forms an invaluable overview and toolkit for Phase 1.

**FUN**

There is something fun about the project branding. Something, adventurous – Indiana Jones, even. While every care should and will be taken with economic, cultural and inter-cultural as well as ecological factors, care must also be taken not to be *too careful.*

Spiritual and eco communities are sometimes weighed down by a kind of religiosity. Which is understandable in the contexts of climate change. But then direr the dirge, the more the need for positive notes.

Inspired by its source, Sipapu’s graphic identity suggests a beautiful, difficult to reach destination, somewhere a personal and collective story of transformation unfolds. Which sounds like, and will be, a whole lot of fun.

**UNRESOLVED QUESTIONS**

*How would you reach Sipapu if there were no fossil fuels?*

With difficulty, is the short answer. The Tambopata is fast-flowing, making paddling against the current impossible. Without a powered boat, one would have to arrive at Sipapu by land, likely trekking cross jungle for about 25km southwards of Route 30C, the Peru arm of the Amazon highway.

*What if international air travel becomes unaffordable for most?*

Unaffordable in any sense – privately, economically or ecologically – would impact the ability of visitors from outside Latin America to arrive at Sipapu. What then? One answer is that Sipapu would have to adapt, becoming more local on the one hand, and more global via the internet on the other. Creative outputs, online workshops, tree sponsorship and other digital products would then become all the more important.

*What materials will the temple be built from?*

The project team is working with Innersphere Design towards high level architectural drawings and specification. Materials and timeline requirements are being assessed, in order to evaluate the viability and practicality of bamboo grown onsite as the main construction material. Hemp-crete is also being looked into, as is adobe. Stone would be
the traditional ultimate, of course, but at today’s prices transporting stone by river (and from where) would be very expensive.

Who will come to Sipapu?

The vision received is of a great many visitors. The project team trust that, in what are very likely the last days of affordable international travel, Sipapu will be worthwhile and popular destination, offering human beings an integrated experience of return to nature, to community, to themselves – in a word home.
AUTHOR CONTRIBUTIONS

The team collaborated extensively from August to November, with weekly video sessions, tracking and sharing online. We spent 2 days together in September to integrate design strategies across all four dimensions and bring the full creativity of the team to every aspect.

The team would like to thank Ezio Gori of GAIA Education, for his invaluable inspiration and wisdom.

A brief account of team collaboration forms Appendix 1.

ANNE-FLORE RACINE
flore@geckoenergy.co.uk

Flore is a founding partner of Devon-based renewable energy consultants Gecko Energy. A keen horse rider and conservationist, she has worked at the forefront of renewable energy system design since 2011. She contributed extensively to the Ecological and Economic dimensions, integrating ecological, economic and business strategies.

IMOLA ANDRAS
imola.andras_uk@yahoo.co.uk

Imola is a keen student of permaculture, splitting her time between garden design and Gaia Education. She carried out in-depth bio-regional research to identify Sipapu’s ecological context. She outlines and evaluates designs for water, energy, food and other regenerative systems in the Ecological Dimension.

NIZAMI ELÉ
info@sipapu.co

Nizami is one of the founding directors of AYNI Foundation and The Sipapu Company. He wrote the executive summary, introduction, worldview and social dimensions, designed many of the maps and diagrams, provided online co-working platforms Slack and Airtable, and hosted collaboration at AYNI Foundation.
APPENDICES
1 Team Documentation

A brief account of the team’s collocation and online collaboration.

The team, Imola, Nizami and Flore, collaborated mainly online through various platforms. Slack was extensively used, a discussion channel was created for each dimension, where each member could share work, ask questions and gather feedback. A more generic channel was also created for non dimension specific related matters, and towards the end to work on final edits of the document.

Airtable was used to keep track of the progress.

What’s app was also used alongside Slack.

The team also jumped on the opportunity to meet face to face in September, as all members are living the UK, it seemed like a natural thing to do and too good to pass. The team met at Nizami’s house in East Sussex, who kindly accommodated them for a couple a days, and provided a lovely environment to brainstorm.

Below are a few extracts of the work achieved there:

Zone Mapping
SWOT Analysis (please refer to appendix 4 for final version)

Economic dimension workings
Phase 1 Crowdfunding Estimates
Business Canvas

Design Integration / Strategic Framework
Each team member worked on specific elements of the case study that were more suited to their individual background, preferences, interests and strengths. The work was therefore divided as follows:

As Nizami was the case study originator, it seemed natural that he would undertake the Social as well as Worldview dimensions, which were also his favourite dimensions of the course. Given his extensive knowledge on the background of the project as well the local area having visited it a few times, he also wrote the introduction as well as the executive summary. His design skills provided some amazing visuals throughout the report and across all four dimensions, and he also undertook the painstaking task of formatting the final document, including the feedback provided by the rest of the team.

Imola’s background in permaculture naturally led her to focus on the ecological dimension, also one of her preferred subjects of the course. A lot of time was initially spent on the ecological questions so the team could really understand the bioregion and get as accurate a picture as possible having not visited the site. Imola and Flore collaborated on some aspects in the research phase, namely carbon neutral design (renewable energy design, biofuel considerations and energy saving measures) as well as water supply, which Imola integrated in the final document.

Flore’s background is in both business and environment, so she undertook the economic dimension with a view to draw from her own professional experience to inform some of her research. Her interest in conservation (both professionally and personally) enabled her to collaborate with Imola on the subjects mentioned above, and to provide an in-depth analysis for the site’s renewable energy. Both Imola and Flore compiled the appendices and put together the presentation.
## 2 SWOT Analysis

Capture from collocated exercise at AYNI Foundation, September 2019.

### STRENGTHS

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<th>What unique resources can you draw on?</th>
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<td>ENLIGHTENMENT</td>
<td>GAIA EDUCATION + DESIGN STUDIO</td>
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<td>WORKSHOPS</td>
<td>CLOSED LOOP SYSTEM</td>
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<td>TRAININGS</td>
<td>COMMITMENT FROM OWNERS</td>
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<td>LAND FOR THE TEMPLE</td>
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<td>PEOPLE CARE</td>
<td>PERMACULTURE</td>
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<td>SPIRITUAL APPROACH</td>
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<td>DEDICATION</td>
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### WEAKNESSES

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<th>Where do you have fewer resources than others?</th>
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<td>LENGTH OF TIME ESTABLISHED</td>
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<td>SANITARY FACILITIES</td>
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<td>SITE’S SUFFICIENCY</td>
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<td>CLEAN WATER</td>
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### OPPORTUNITIES

### THREATS

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<td>RECONNECT WITH NATURE THROUGH SPIRITUAL</td>
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<td>PR</td>
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<td>LOCAL TRADE/BOUTIQUE ECONOMY</td>
<td>THOUGHT LEADERSHIP?</td>
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<td>CARING FOR NATURE (DONATION)</td>
<td>LOCAL EMPOWERMENT</td>
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<td>TREE SPONSORSHIP</td>
<td>USE STRENGTHS FOR RESILIENT BUSINESS</td>
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<td>SAVE FOREST</td>
<td>FUNDING</td>
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<td>NEW BUSINESS OPPORTUNITIES</td>
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<table>
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<tr>
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<th>What trends could you take advantage of?</th>
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</table>

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### 3 Co-visioning Survey Results


The 22 seed-funding investors were asked what they thought about the vision.

<table>
<thead>
<tr>
<th>For you personally</th>
<th>Agree</th>
<th>Disagree</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>Does the vision inspire you?</td>
<td>20</td>
<td>0</td>
<td></td>
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<tr>
<td>Is it meaningful?</td>
<td>20</td>
<td>0</td>
<td>Could emergence be confused with emergency?</td>
</tr>
<tr>
<td>Does it resonate with your personal vision and mission?</td>
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<td>0</td>
<td></td>
</tr>
<tr>
<td>Do you feel included in it?</td>
<td>20</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>How would you change it?</td>
<td>20</td>
<td>0</td>
<td>Is it too focussed on the temple, at expense of ecovillage?</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>For the group</th>
<th>Agree</th>
<th>Disagree</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it simple and authentic?</td>
<td>17</td>
<td>3</td>
<td>What is right relationship?</td>
</tr>
<tr>
<td>Does it reveal our core values?</td>
<td>18</td>
<td>2</td>
<td>Spiritual connection with nature is implied. Could it be clearer?</td>
</tr>
<tr>
<td>Does it focus on the who what and why of the project?</td>
<td>10</td>
<td>10</td>
<td>Who? Is a bit vague? Lines 4 and 5 added to statement</td>
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<tr>
<td>Is it clear and specific?</td>
<td>19</td>
<td>1</td>
<td>It’s concise and poetic</td>
</tr>
<tr>
<td>Is it memorable?</td>
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<td></td>
<td></td>
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<tr>
<td>Is it purposeful</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does it inspire the group?</td>
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<td></td>
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<tr>
<td>Does it give a feel for the community, once realised?</td>
<td>15</td>
<td>5</td>
<td>Who and what they are doing is a bit vague. Better w/ lines 4 and 5.</td>
</tr>
<tr>
<td>Does it express passion and commitment?</td>
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<tr>
<td>Is it doable?</td>
<td>20</td>
<td></td>
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</tbody>
</table>
4 Environmental Factors
Data used in designing autonomous solar energy systems

**Maximum temperature at 2 metres**

**Minimum temperature at 2 metres**

**Relative humidity at 2 metres:**
**Precipitation**

![Precipitation Graph]

**Total column precipitation water**

![Total column precipitation water Graph]

**OTHER FACTORS**

*Minimal available insolation over a consecutive month period*

![Minimal available insolation Graph]

**Dark day averages to size battery storage**

![Dark day averages Graph]
Daylight hours

- On the 21st December, the sun will rise 96° east of due north and set 96° west of due north.
- On the 21st March/21st September, the sun will rise 91° east of due north and set 91° west of due north.
- On the 21st June, the sun will rise 86° east of due north and set 86° west of due north.
- Optimum angles in degrees from vertical
  - Winter – 54 degrees
  - Spring / Autumn – 78 degrees
  - Summer – 102 degrees.

CLIMATE DATA FOR TAMBOPATA

<table>
<thead>
<tr>
<th>Month</th>
<th>Air temperature °C</th>
<th>Relative humidity %</th>
<th>Daily solar radiation - horizontal kWh/m²</th>
<th>Atmospheric pressure kPa</th>
<th>Wind speed m/s</th>
<th>Earth temperature °C</th>
<th>Heating degree-days</th>
<th>Cooling degree-days</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>24.41</td>
<td>73.71%</td>
<td>4.37</td>
<td>94.7</td>
<td>2.0</td>
<td>24.7</td>
<td>0</td>
<td>447</td>
</tr>
<tr>
<td>February</td>
<td>24.43</td>
<td>71.38%</td>
<td>4.54</td>
<td>94.7</td>
<td>1.9</td>
<td>24.6</td>
<td>0</td>
<td>406</td>
</tr>
<tr>
<td>March</td>
<td>24.63</td>
<td>68.81%</td>
<td>4.41</td>
<td>94.7</td>
<td>1.9</td>
<td>24.6</td>
<td>0</td>
<td>454</td>
</tr>
<tr>
<td>April</td>
<td>24.55</td>
<td>61.25%</td>
<td>4.47</td>
<td>94.8</td>
<td>2.0</td>
<td>24.6</td>
<td>0</td>
<td>437</td>
</tr>
<tr>
<td>May</td>
<td>24.25</td>
<td>49.99%</td>
<td>3.9</td>
<td>94.9</td>
<td>2.2</td>
<td>23.6</td>
<td>0</td>
<td>442</td>
</tr>
<tr>
<td>June</td>
<td>23.61</td>
<td>42.66%</td>
<td>3.88</td>
<td>95.0</td>
<td>2.5</td>
<td>22.6</td>
<td>0</td>
<td>408</td>
</tr>
<tr>
<td>July</td>
<td>23.49</td>
<td>33.48%</td>
<td>4.45</td>
<td>95.1</td>
<td>2.8</td>
<td>22.6</td>
<td>0</td>
<td>416</td>
</tr>
<tr>
<td>August</td>
<td>23.07</td>
<td>50.77%</td>
<td>5.03</td>
<td>95.0</td>
<td>2.8</td>
<td>24.7</td>
<td>0</td>
<td>467</td>
</tr>
<tr>
<td>September</td>
<td>26.74</td>
<td>34.33%</td>
<td>5.2</td>
<td>94.8</td>
<td>2.6</td>
<td>27.0</td>
<td>0</td>
<td>502</td>
</tr>
<tr>
<td>October</td>
<td>27.27</td>
<td>41.47%</td>
<td>5.17</td>
<td>94.7</td>
<td>2.2</td>
<td>28.0</td>
<td>0</td>
<td>539</td>
</tr>
<tr>
<td>November</td>
<td>26.27</td>
<td>55.05%</td>
<td>4.9</td>
<td>94.6</td>
<td>2.2</td>
<td>27.1</td>
<td>0</td>
<td>488</td>
</tr>
<tr>
<td>December</td>
<td>25.49</td>
<td>65.54%</td>
<td>4.67</td>
<td>94.6</td>
<td>2.0</td>
<td>26.0</td>
<td>0</td>
<td>480</td>
</tr>
<tr>
<td>Annual</td>
<td>25.0</td>
<td>52.3%</td>
<td>4.60</td>
<td>94.8</td>
<td>2.3</td>
<td>25.1</td>
<td>0</td>
<td>5,485</td>
</tr>
</tbody>
</table>

[Table showing climate data with columns for temperature, humidity, solar radiation, pressure, wind speed, earth temperature, and degree-days for heating and cooling.]
5 Biofuel Conversion

Further considerations, converting the shuttle boat to biofuel

Boat is currently the only practical access to Sipapu. The nearest town Puerto Maldonado is just under 30 km away as the crow flies, although following the sinuous course of the river La Torre, it is in fact twice that distance and therefore it takes approximately 2-3 h downstream and just over 4h upstream to do the journey.

The boat is currently used to ferry supplies from the town, i.e. food and fuel for the onsite generator, and it will also be used to ferry visitors coming to stay at Sipapu. It is expected that as the site becomes more self-sufficient in food production and energy generation from renewables that the frequency of the journeys to town for supplies will be reduced. Sipapu's boat will essentially become public transport, which is not only good customer service, as it saves visitors having to make their own transport arrangements, which in turn reduces the amount of fossil fuels used to get to the site (1 boat with all the visitors, as opposed to several boats with only perhaps a couple of visitors), it is therefore also more environmentally-friendly (fossil fuels use reduced due to lesser need for going to town, and distributed across the number of visitors, therefore carbon footprint per person is reduced).

In order to make this even more efficient, Sipapu may need to restrict the ferry service to perhaps once a week on a “changeover” day, the boat will take the leaving visitors to town and bring back the new visitors along with any necessary shopping. This frequency may be increased at a future date should the need of the site request it, i.e. more frequent changeover days per week.

Some may argue that this shuttle service should coincide with visitors arriving and departing schedules. However, it would be impossible for this to happen for the following reasons:

- Visitors come from all around the world and it would be impossible to cater for each specific circumstance
- Some visitors may come to Peru only in order to visit Sipapu, some may visit Sipapu as part of another journey, i.e. a tour of Peru
- The nearest town Puerto Maldonado is well enough equipped so that visitors can comfortably stay a few hours or even the night whilst they wait to get to Sipapu/for the next leg of their journey, so there is no need for more frequent boat shuttles
- The fact that Sipapu offers a shuttle should be satisfactory enough to visitors so that they do not feel the need to arrange their own transport and therefore will be happy enough to be subject to the shuttle’s timings
- The remoteness of Sipapu is in itself a good enough reason to have a dedicated shuttle service with restricted schedule
- It is a great way for Sipapu to have control over one aspect of the carbon emissions of their visitors
A next step perhaps in making this service more environmentally friendly, and which would also further reduce the overall carbon footprint of the Sipapu project as a whole, would be to convert the engine of the boat to biodiesel.

This is a very attractive proposition for the following reasons:

- Biodiesel is cheaper than fossil fuel and no changes in existing propulsion systems are needed (usually a blend is used up to 20% biodiesel with petroleum diesel)
- Biodiesel is of course far more environmentally friendly and a lot safer to use (Fatty acid methyl esters FAME)
- Biodiesel is more sustainable as it can be homemade using by-products/waste etc.
- It is better for the engines (however it is more suitable to bug growth due to high water absorption and degrades quicker as less stable, so not ideal to leave in the tank for lone periods of time, which may not necessarily be that much of a drawback for Sipapu, as the journeys will all be predictable, more on this below).
- It would also greatly benefit the image of Sipapu, as the shuttle boat will essentially be their first contact with the centre; although they may not think twice that it uses fossil fuels (although some visitors probably would), they would definitely notice if it used biodiesel (nicer smell!) which would reinforce the environmental ethos of the site.
- The conversion is potentially really easy and affordable (see further below)
- It’s a good case for crowdfunding as it is easy to support with facts and evidences and is a realistic and achievable target

Just a quick browse on the web find many articles supporting that idea, here are a few examples and quotes:

“Biodiesel is less toxic than table salt, says Kaleb Little, National Biodiesel Board senior communications manager, adding that the fuel also burns cleaner than petrodiesel and biodegrades as fast as sugar. In his opinion, most people simply don’t know those facts. “Biodiesel blends are an excellent choice for power on the water and have many benefits as a more sustainable option for fueling recreational boats … and other marine applications,” Little says.” 58

“The National Biodiesel Board is continuing to push the fuel for boaters. “It has been clearly demonstrated that biodiesel works in marine diesel applications,” Little says. “Biodiesel is serving as a cleaner-burning, more environmentally friendly option for the marine environment. It is important for boaters to do their part to ensure future generations can enjoy the water the same way that they do.” Ibid

“Everybody talks about how we’re reducing emissions because we’re using natural gas,” he adds. “If we used B20 it would be so much better. It reduces emissions, on average,

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58 Soundings Online
85 percent, compared to petroleum diesel. It's the best fuel out there in terms of greenhouse gas emissions.” Ibid and 59

A few considerations with regards to conversion:

Depending on the age of the boat and of its engine, it may be worth contacting the manufacturer first to ensure converting to biodiesel will not void the warranty.

As explained above biodiesel is potentially more subject to bacterial action, and it degrades much quicker (good for the environment, not necessarily for the fuel tank). Another issue potentially is that biodiesel is an aggressive solvent, therefore some metals cannot come in contact with it and rubber seals etc may need replacing often (to factor in maintenance costs). The potential drawbacks of biodiesel are well understood. 60 61 62

Conclusion

Biodiesel could be an interesting avenue to pursue, it is not an essential part of the project, and definitely not in these early stages, but it would be a great addition and definitely reinforce the ethos, the devil is in the detail as such.

On the surface converting the boat engine to biodiesel is very straightforward in that no modifications are necessary. The properties of biodiesel have to be taken into consideration however and some of the more fragile parts of the boat may need to be refitted appropriately (i.e. rubber seals) to accommodate biodiesel.

Biodiesel is cheap to make and use, is safe and very environmentally friendly, and is a recognised alternative to traditional fuel. However, it is worth making sure the engine manufacturer will not void the warranty is a blend of biodiesel is used.

Another potential consideration in order to make the shuttle boat more efficient and environmentally friendly would be to convert it to electric drive. This is a relatively new concept however, although it has been done on boats of similar size as well as sailing boat. The cost of such conversion would be prohibitive however at this stage, but it is possible and it is worth noting for future reference.

59 Sailors for the Sea Green Boating Guidelines
60 Marine Surveys
61 Ocean Vessels Going Green, Biofuels Digest
62 Be Sustainable Magazine Marine Sector Prospects and Trends