纵向维度：
本地生态与垂直经济

ALTITUDES:
LOCAL ECOLOGIES AND VERTICAL ECONOMIES

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- 1. 秘鲁塞尔瓦中央林区
- 1. The Selva Central region of Peru

摘要

“塞尔瓦中央林区”是秘鲁境内一个由高海拔森林构成的乡村地区，当地经济主要依赖咖啡生产。单一种植对该地区的影响包括由仰赖单一商品造成的经济脆弱这样的显性影响，以及当地社区多元文化与传统丧失这样的隐性影响。在该地区咖啡远销全球的同时，当地农业模式正因气候变化发生着转变。

除了介绍“纵向维度”方案的具体策略，本文亦探讨了如何对气候变化进行可视化呈现、反思供应链现状，以及对作为垂直经济的在地景观进行解读等多元尝试，在突破咖啡单一种植模式的同时，力求为建立可（部分）自给自足的新社区创造条件。

关键词
景观；咖啡；单一种植；气候变化；战略

ABSTRACT

“Selva Central” is a rural area of Peru defined by high-altitude forest, whose economy is largely dependent on the coffee production. The effects of monoculture are both tangible and intangible, ranging from a weak single-commodity economy to the loss of the multifaceted cultural expertise and traditions of local communities. The area, in fact, produces coffee for global exportation, while is suffering shifting local agricultural patterns due to climate change.

This article argues while unfolding “Altitudes” strategic project, how visualizing climate change, rethinking the supply-chain, and understanding the local landscape as a vertical economy can highlight opportunities of moving beyond the monoculture of coffee, creating the conditions for newly (partially) self-sufficient local communities.

KEY WORDS
Landscape; Coffee; Monoculture; Climate Change; Strategy

译 刘妹 陆小璇
TRANSLATED BY LIU Shu LU Xiaoxuan

塞尔瓦中央林区

塞尔瓦中央林区位于秘鲁亚马逊热带雨林的边缘，包括胡宁和帕斯科两个行政区。塞尔瓦中央林区地理条件特殊——这里既属于安第斯山脉，也是亚马逊河流域的一部分。塞尔瓦中央林区由亚热带森林组成，海拔高度700~2 000m。由于当地气候相对温暖且雨量充沛（年降雨量高达3 000~8 000mm），塞尔瓦不但是生物多样性热点地区，也是咖啡生长的理想场所。

该地区的经济主要依赖咖啡出口。因此，咖啡生产是当地居民主要从事的经济活动，这一经济模式同时塑造了当地景观。

如果说单一商品经济脆弱且缺乏韧性，那么这一情况在咖啡产业中尤为明显。由于咖啡生产容易受气候等多种因素的影响，其产量极不稳定。有时咖啡会供不应求，但更多时候是供大于求。正如联合国粮食及农业组织所说，“鉴于对单一商品的高度依赖，单一商品经济体的总体出口情况不可避免地与该商品的经济形势和价格波动挂钩”^[1]。而当地社区则是这个本就脆弱的生产链中最薄弱的一环。

“纵向维度”项目

“纵向维度”是Openfabric景观规划公司提出的一项区域性策略方案^[2]，旨在为

塞尔瓦中央林区建立一种突破传统单一咖啡种植的发展模式，在积极应对由气候变化导致的农业模式变化的同时，力求为建立可（部分）自给自足的新社区创造条件。

农村社区通常具有如下特征：农产品结构丰富多样，主要用于家庭自给，余下的部分则在当地市场售卖，从而形成小规模的地方经济。其中的重中之重是，农产品结构必须丰富多样，以满足当地农民自身的食品需求。而当全球市场开始引导当地咖啡生产由自食转向出口时，便导致了该地区农产品多样化程度的下降。对单一商品的依赖严重削弱了该地区的经济独立性，亦在逐渐湮灭当地已实践了数百年的传统农业知识。

垂直经济

“纵向维度”项目聚焦于森林的垂直特性，致力于寻找可能替代当前单一咖啡种植模式的方案。当地咖啡种植区目前使用“半遮荫式”混种技术，即一种将咖啡灌木种植在浓密树冠之下的方案，这可以作为提高农产品多样性的切入点。事实上，我们可以通过新增种植品种的方式继续扩大现有混种组合的多样性。基于这一考量，“纵向维度”项目将该地区现有的两层混种系统增加至4层：第一层为新增的地表覆盖层，除了生产功能之外，这些覆盖地表的植被还可以缓解由于极端气候事件的增多而日益加剧的水土

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- 2. 种植园中晾晒的咖啡豆
- 3. 当地社区是脆弱的单一商品经济体系中最为薄弱的一环
- 4. 塞尔瓦中央林区咖啡主产区地图

- 2. Coffee beans drying in the sun at the plantation
- 3. Local communities are especially vulnerable in a weak single-commodity economy.
- 4. Map showing coffee producing hubs in Selva Central

流失问题；第二层是咖啡灌木种植层；新增的第三层可大量种植中小型丰产果树，并间或种植香蕉、鳄梨、芭蕉等耐半荫作物；最后一层是大型乔木种植层，它可以提供基本的生态系统服务，如丰富生物多样性、增加空气含氧量，同时也可进行适度的原木生产。

当地的新生经济在这种种植模式下纵向展开。不仅咖啡种植产业得到了保留，新引入的作物种类提高了当地的农产品多样性，并打破了原本依赖单一咖啡生产的市场模式，有利于扶持新的产品类型。

迁移的景观

“垂直性”不仅被用于分析上述混种系统，同时体现在描述由气温上升而引起的动

态气候变化：塞尔瓦中央林区中满足咖啡种植环境条件的地区正在逐年向高处迁移。

乡村景观可被视为因迁移而形成的临时属地。我们对乡村景观知之甚少，正如雷姆·库哈斯所指出：“大量统计数据印证了无所不在的城市化大潮，但大潮背后的另一面却被我们所忽视——那些涌入城市的人和物原本归属的地方发生了怎样的变化？”^[3]人们普遍意识到城市人口已经超出农村人口这一事实，但是鲜有人关注非城市地区的现状。

乡村景观不仅承载着人力资本、经济及商品的巨变，景观本身也在发生着迁移。正如布伦特·米利根所指出：“我们大多数人把‘迁移’解读为孤立的事物（诸如鱼、鸟、人）在某一固定环境下（诸如克拉马斯河、太平洋鸟类迁徙路线、美国-墨西哥边

界）的移动。我们明明知道环境条件在不断变化，但却在处理具体问题时忽视这些环境变化。”^[4]

环境因素的不稳定性是影响塞尔瓦中央林区的一大特质。事实上，由于气温升高，农民们正在把咖啡种植地迁移到更适宜咖啡生长的高海拔地块上。这既意味着景观在三维空间中的动态迁移，也造就了新的“闲置景观”。伴随着这种景观迁移，出现了许多现已弃用的咖啡种植地块。在“纵向维度”方案的愿景中，这些空地景观能够成为促进新的多商品农村经济的契机。可可豆种植（咖啡原料作物）为我们提供了审视在迁移景观中培育新作物的一个视角：通过将当地的咖啡经济与新的多样化农产品结构结合起来，可以克服当地经济对单一商品的依赖。

我们不能仅仅看到气候变化的影响所带

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Half-shaded Polyculture “半遮荫式”混种模式

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来的“新的机遇”。“纵向维度”方案制定了一套气候应急措施，以应对新的可持续农业经济模式中可能出现的问题。

气候变化可视化

在地理空间上呈现气候变化的影响，一方面有助于我们了解在哪里可以或应该采取上述应急措施，另一方面也能够反映出全球经济对本地生态的影响。

事实上，将气候变化的影响进行可视化是设计学科应该肩负的责任。由于日常生活

中很少发生极端气候事件，人们对气候变化问题的紧迫性仍缺乏认知。

通过设计和艺术装置将气候变化的影响具象化，是使人们直观地了解气候变化的有效途径。这方面的案例包括Openfabric景观规划公司设计的“倒下的森林”项目^[5]及奥拉维尔·埃利亚松工作室设计的“冰川守望伦敦”项目^[6]。在这两个项目中，受气候影响的景观碎片被设置在城市环境中，借由向人们传达震撼、不适感和模棱两可的情绪，以引起公众对气候变化议题的关注。

艺术装置似乎是传递环境变化信息和

激发公众意识的直接而有力的工具。与此同时，对气候变化的空间特征以及更广泛意义上的迁移景观动态性的可视化呈现，仍有较大的发展和提升空间。“测绘”作为一种“反思和自省”^[7]的工具，能够以预测的方式反映出环境因素的不稳定性所带来的地理变化。正如我们在“纵向维度”项目中所进行的尝试，环境变化的可视化使我们能够知晓应该在哪些地区采取应急措施，以及已经失去原有生产能力的景观如何成为解决农村社区对单一商品经济过度依赖问题的关键。**LAF**

5. 有助于提升区域农业多样性的“半遮荫式”混种模式
6. “4层系统”混种技术图示
7. 环境因素的不稳定性是影响塞尔瓦中央林区的一大特质

5. Half-shaded polyculture as the starting point to increase agro-diversity in the region
6. Diagram showing four-layered intercropping system
7. Background instability is a defining condition of Selva Central.

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Selva Central

Selva Central is a geographical area located at the edges of the Peruvian Amazon rainforest, which includes the administrative regions of Junín and Pasco. It is defined by a specific geographical condition, as it is simultaneously part of the Andes mountain range and the Amazon Basin. Selva Central is a sub-tropical region defined by high-altitude forests, located between 700 to 2,000 meters above sea level. The relatively warm climate at the extremely intense waterfalls (between 3,000 ~ 8,000 mm per year) make the Selva an extremely biodiverse area of the planet and create the perfect conditions for coffee production.

The region is largely dependent on the production of coffee for export, which employs large part of the local population and shapes its landscape.

If single-commodity economies are weak and un-resilient, the coffee production is

even more so, as its production is extremely volatile due to discontinuous yields which, impacted by several factors as climate, can be extremely discontinues in time. In some periods, the supply is far below the demand, opposed to long periods of oversupply. As the Food and Agriculture Organization of the United Nations states “in view of the high dependence on a single-commodity, the overall export performance of single-commodity economies is inevitably tied to trends and fluctuations in the revenues from that commodity.”^[1] The local communities are the weakest part of this weak production chain.

Altitudes

“Altitudes” regional strategic project by Openfabric^[2] aims to develop a model for Selva Central to move beyond the monoculture of coffee, acknowledging the changing agricultural patterns due

to the changing climate, while creating conditions for newly (partially) self-sufficient communities.

Rural communities have traditionally been autarchic ones: a diversified agro-production was primarily providing food for self-reliance, while the surplus was used for local trade, creating small-scale local economies. The production needed to be rich and diverse in order to feed the locals themselves, first. When the global market started to lead the coffee production towards the export, the agro-diversity started to drop. The dependence on single-commodity has, first of all, undermined the independence of the local communities, and has faded their centuries-long traditional knowledge, a set of intangible (agri)cultural expertise, which are now threatened if not even already lost.

Vertical Economies

“Altitudes” focuses on the verticality

of the forest, in the search of possible alternatives to the monoculture of coffee. The currently used “half-shaded” growing technique, an agroforestry solution which integrates coffee shrubs below a thick canopy of trees, is the starting point to increase agro-biodiversity. In fact, such section can be enriched in its diversity by including several new productive species: from a 2-layered system, the strategy proposes a 4-layered one. A first ground-covering level is added, characterized by species which, in addition to their productivity, can limit the soil erosion — a pressing issue aggravated by the increase of extreme climatic events. The second level is defined by the coffee shrubs; above it, a new third level is added: here small- or medium-size productive trees can be planted and a great number of fruit trees such as banana, avocado, and plantains (amongst others) can find their habitats in such a half-shaded

condition. A last layer of large trees provides biodiversity and oxygen, as basic ecosystem services and a controlled log production.

New economies unfold vertically through this model, where the coffee production is preserved, but new species are added in order to increase the agro-biodiversity of local communities and to supplement the coffee-driven market with new products.

Migrating Landscape

Verticality is not only analyzed in the territorial section, but also describes the climate-change dynamics induced by the rising temperature: the Selva Central landscape is actually migrating upwards, in order to comply to required environmental conditions to maintain the current agriculture production.

Rural landscapes are transient territories of migrations and, as Rem Koolhaas questions, “we are bombarded with statistics confirming the ubiquity of the urban condition, while the symmetrical question is ignored — what are those moving to the city leaving behind?”^[3] While the notion of the urban population recently overtaking the rural one is given for granted, what happens in the non-urban areas is less under the spotlight.

Rural landscapes are witnessing dramatic migratory phenomena in terms of human capital, economy, and goods; sometimes the landscapes themselves migrate. As Brent Milligan argues, “most of us imagine migration as the movement of isolated things (fishes, birds, people) against a fixed background (the Klamath River, Pacific Flyway, U.S.-Mexico border). We know that environmental conditions are always changing, but we allow ourselves the

8. 区域断面图展现了本地多种经济作物在塞尔瓦中央林区的纵向分布
 9. Openfabric景观规划公司为在意大利曼图亚市举办的首届城市森林世界论坛所创作的“倒下的森林”
 10. 由奥拉维尔·埃利亚松和米尼克·若瑟林合作完成的“冰川守望伦敦”装置配合第24届联合国气候变化大会（COP24）进行展出。
8. Territorial transect showing the production of local cash crops organized vertically in the Selva Central region of Peru
 9. Fallen Forest by Openfabric in Mantua for the first World Forum on Urban Forests
 10. Ice Watch London by Olafur Eliasson and Minik Rosing on the occasion of the COP24 Climate Change Conference

fiction of background stability.”^[4]

Background instability is a defining condition of Selva Central. In fact, due to the rising temperature, farmers are moving coffee production to higher altitudes, seeking for preferred habitats. Moving cultivations uphill determines the migration of landscape in a 3-dimensional dynamic and, at the same time, generates a new “vacant landscape.” These new territories where coffee used to be cultivated, are landscapes’ by-products of migration. “Altitudes” strategy points out a geography that can now address the definition of a new multi-commodity rural economy. Cocoa is one — amongst many — opportunity to develop new crops in the migrating landscapes, to integrate the local economy of coffee with new opportunities of diversity, and to overcome the single-commodity dependence.

The effects of climate change cannot be considered as mere “new opportunities”; the strategy develops a set of emergency measures that can be undertaken to address new sustainable agro-economical models.

Visualizing Climate Change

Representing the geographical implication of climate change appears to be key to understanding where these measures can or should be taken, while showcasing the consequences of global economies on local ecologies.

Visualizing climate change effects is, in fact, an act of responsibility that design disciplines should tackle. The apparent distance between daily life and the most extreme climatic events tends to decrease the awareness on the urgency of the phenomena.

Tangibility of climate change consequences appears to be effectively faced through design and art installations; it is the case of “Fallen Forest”^[5] by Openfabric and “Ice Watch London”^[6] by Studio Olafur Eliasson where fragments of “affected” landscapes are located in urban environments and draw attention towards the topic through shock, discomfort, and the ambiguity of an undisguised aesthetic.

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11-1

If installations seem to be immediate and powerful tools to carry a disruptive message and fostering awareness, the potential importance of “mapping” the spatial implication of climate change, and more in general, the dynamics of migrating landscapes, appears to be still

under-exploited. The act of mapping, as a “reflective and reflexive”^[7] tool, can intercept the changing geographical patterns of the background instability in a projective manner. As in “Altitudes,” mapping can visualize where emergency measures should be addressed, and how landscapes,

where they have lost their former productive capacity, can be key to tackling the stringent issue for rural communities, of the socio-economic dependence from fragile single-commodity economies. **LAF**

11-1. 图示绘制了在本地、区域、国家及国际尺度上，咖啡的生产、加工及运输流程。

11-2. 图示呈现了通过为本地引入与咖啡种植共存的更为多元化的食物种植，进而开发咖啡主题旅游和食物主题旅游线路的区域发展模式。

11-1. Diagram mapping the production, processing, and distribution of coffee across local, regional, national, and international scales.

11-2. Diagram showing a wider array of locally grown and native foods that bring new opportunities for coffee tourism and food tourism.

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