

俞孔坚，2013年6月2日摄于武陵。
Taken by Kongjian Yu, Wulong, June 2, 2013.



乌江武陵段：两种对待自然过程与格局的方式。图片的左侧是城市 and 建筑对其友好和适应的方式：将景观作为生态的基础设施，获得免费的生态系统服务，包括对洪水的弹性适应、人居环境气候的调节、审美，甚至生产功能；在图片的另一侧，造价高昂的灰色基础设施取代了原有的生机勃勃的景观，在“基础设施建设”的名义下，毁掉了自然景观中生态的“基础设施”，随之消失的是更综合的、人类生存所必须的、可持续的生态系统服务。本来没有必要，或至少不完全必要的防洪工程和水电工程，使乌江与中国的众多江河一样，遭到毁灭性破坏。作为中国大地上的一条生态廊道——维护国土生态安全的关键性的生态“基础设施”——的乌江正在消失。不幸中的万幸，地方政府已经开始认识到，景观设计师也许可以拯救这段河流。

Wulong Section of Wujiang River: Two different ways of treating with the natural process and pattern. On the left side of this picture is a friendly and adaptive way to the city and built environment. It takes landscapes as ecological infrastructure and will freely benefit from the ecological system, which includes resiliently adapting to flood and climate change in living environment, enhancing aesthetic value, and even functioning productive performance; On the right side, through erasing the comprehensive and sustainable ecological system that is essential to human survival, those vibrant landscapes have been replaced by expensive grey infrastructure under the guise of “infrastructure construction”, and destroyed the ecological “infrastructure” in the natural landscape. Like hundreds of rivers in China, these flooding control and hydropower engineering works ruining Wujiang River are not, or not exactly, an indispensable means to protect human existence. As an ecological corridor, the key ecological “infrastructure” of the National Ecological Security Pattern in China, Wujiang River is disappearing. A silver lining in this tragedy, the local government has begun to realize that the river might be saved by landscape architects.

景观作为生态基础设施

前不久，受当地政府委托，我对乌江两岸的景观进行了规划设计。带着自幼就在心中孕育的对乌江神秘而美丽的图景的无限向往，我和设计团队奔赴乌江。但眼前所见的情景，却让我感到无比失望和沮丧：这条有着无数故事和传说——或凄楚动人，或激情豪迈——的激流天险，竟然被改造成了一条水泥渠道：高达几十米的防洪堤削平了两岸犬牙交错的岩石；光滑的水泥荒漠替代了茂密的植被和千万生命的栖息地。唏嘘之余，便是对这种人类暴行和无知无德的愤怒和悲哀。近十座建成或在建的水电站、不断延伸的防洪堤工程，正在“基础设施建设”的名义下，将一条中国大地上非常重要的生态廊道捆绑、肢解。这条为中国广大城市和乡村提供过源源不断的生态服务的自然“基础设施”，正走向死亡！而遭受着同样命运的中国名川大河，又岂止乌江！毁灭性的灾难已经或正在降临到大渡河、金沙江、澜沧江、闽江、湘江，甚至黄河、长江等无数条孕育了中华文明的千百年不绝的生命之流。

如果说“基础设施（Infrastructure）是指为社会生产和居民生活提供公共服务的物质工程设施，是用于保障国家或地区的社会经济活动正常进行的公共服务系统，是社会赖以生存发展的一般物质条件”，那么，为什么我们不能保留这些千百年来为人类提供无尽服务的、自然的、免费的且富有生命力的“基础设施”，却要将其毁掉或肢解；而却为了获得同样的服务，投入巨大的代价来兴建机械的、灰色的“基础设施”？

为了防洪？北京大学的研究团队揭示，即使将全中国的防洪堤都拆掉，中国可能淹没的国土面积仅占国土总面积的2.8%；而为了保护这2.8%，我们每年投入近千亿元人民币来修建所谓的防洪工程！千百年来，我们不断地将全国人民艰辛劳动所创造的价值，年复一年地付之东流，这难道不值得每个当代中国公民，特别是决策者反思吗？如果说在农业时代，这2.8%的土地事关千百万人的生计

和生命，是因为中国在20世纪初国民生产总值的90%甚至更多都来自于农业，每平方米土地的得失都事关当地人民的兴衰。但今天不再是这样了，农业对这个国家经济的贡献已下降至不足10%，我们完全不必与洪水争地。更何况，天下本无洪水，洪水是不明智的规划和建设所导致的结果。

为了发电？中国水力发电量仅占全国电力总产量的15%。为了发电，我们在国土尺度上，毁掉了地球生态系统中最关键的“基础设施”——河流系统，甚至整个水系统。而更具讽刺意义的是，正是为了水，我们又规划了通过13个梯级式抽水泵站、总扬程65m的南水北调工程，将长江流域的水调往黄河流域。这种巨型的、国土尺度上的基础设施的建设和日常运转，又将消耗多少电力？

为了解决北方缺水问题？殊不知，仅仅北京一城，每年排入大海的雨水就多达40亿立方米，而南水北调工程为北京输送的水量仅30亿立方米。每当夏秋之际，几乎所有城市都惊恐于雨涝灾害。为应对这样的雨涝，我们的城市投入巨资，建造了超大规模的排水管道和排水泵站，恨不得使每一滴雨水瞬间消失。如将降落在北京地域内的水都留下，哪怕只保留四分之三，就没有从南方调水的必要了。而作为巨大的灰色基础设施，南水北调工程对区域的自然和人文过程的破坏——包括对城乡水系统网络、文化遗产、人们出行网络和社区联系等的破坏所造成的生态、社会、文化和经济代价，则远非简单的数据可以估量。

为了解决城市内涝？千百年来先民们对雨涝的适应过程——失败的教训或是成功的经验——最终在古老的中华大地上留下了与当地气候相适应的自然或人工的生态基础设施：珠江三角洲的桑基鱼塘、江南的水网、西南山区的陂塘系统、北方的水淀泡子……它们是文化遗产，是应对洪涝灾害的适应性景观，是最好的生态基础设施，并为世代代的人民持续提供着免费的服务：包括提供食物

和洁净的水源、调蓄雨洪、抗旱防灾、保育生命万物。它们富有诗情画意，且往往成为一方人民之精神慰藉。然而，我们的城市却有意无意地忽视这种生态“基础设施”的存在，挥舞规划的笔杆、开动移山倒海的机械、制定强制性的法规文件，先“一平”抹去土地上的一切纹理，铺开一张张“白纸”，再“三通”，布置出灰色的“基础设施”——宽广的马路和供水、供电及排水管网。一个系统的、免费的生态基础设施，被替换成一个个功能单一的、昂贵的灰色基础设施，其结果正是我们目前所看到的景象：在自然过程面前，城市丧失了弹性。

为了治理水污染？我的父辈们将人畜粪便当作宝贝收集起来，作为作物的最好肥料。现如今，这些农家宝贝没有施入急需肥料的农田，却被城里人认定为污水和废物，通过排污管道被直接排入河流和湖泊，以至于对水体造成污染。与此同时，农民们也不再使用这些免费的有机肥，转而在那些冒着黑烟、流淌着有毒污水和释放出有毒气体的化肥厂购买高价的无机化肥来维持作物的产量。而在城市的另一端，工程师们发明的污水处理厂，正通过无数的管道，开动昂贵的机器、耗费巨大的电能，致力于脱去那些污水中的养分，全然不在意那电流的源头正冒着黑烟或正在扼杀一条生命的河流。诸如此类的基础设施导致了自然的物质循环和代谢系统的短路。而这种短路，只能使水、土壤及空气的污染进入恶性循环的怪圈。

为了提供交通服务？我们修建宽广的道路，以便让更多的汽车开得更快；我们封闭道路两侧的出入口，建立起中央隔离带，以便维持高速干道这一基础设施骨干的连续和通畅。殊不知，这已经损害了更致密而高效的交通网络和更安全、绿色的交通方式：步行和自行车系统。

请不要误会，我不是无为主义者，更不是在否定人类的当代

文明，我是在呼唤更富智慧、更文明和更能系统地整合自然与人文过程的新型的基础设施——生态基础设施。也就是将景观作为基础设施，来系统地解决当代城市的种种病症，包括区域和局地的洪涝灾害、干旱缺水、水和土壤的污染、栖息地和生物多样性的消失、居民日常出行的困难、对自然的疏离、环境体验的枯燥、社区认同感的淡薄、精神世界的匮乏等。这样的生态基础设施和生态化的基础设施将给我们带来新的城市图景：丰产、节约、基于自然系统而不乏人类智慧的创造、弹性的和充满诗情画意的新桃源；这样的新型基础设施将为我们带来低碳、智慧、生态的新生活；这样的基础设施将推动我们创造新的文化，引导我们走向新的文明，即生态文明。（蔡金栋 译）

Landscape as Ecological Infrastructure

Not long ago, I was entrusted by the local government to plan and design a new landscape along the Wujiang River. Since I was a kid, I had looked forward to visiting the mysterious and beautiful Wujiang River. With high expectations, my design team and I set off for the river. But when we arrived, what I saw disappointed and frustrated me. The river, a place of innumerable stories and legends, should have been a torrential and dangerous landscape, witnessing sorrowful and pitiful, or passionate and bold history. Instead, it had been reconstructed into a cemented channel, and flood protection embankments, dozens of meters high, had cut flat the zigzag rocks on both banks. The smooth cement desert of engineering had replaced lush vegetation and crucial habitat for wildlife. I felt angry and sad about the atrocity, ignorance and viciousness of human beings. A dozen hydropower stations that had been completed or were under construction, together with the expanding flood control embankments, had succeeded in tying up and strangling ecological corridors of crucial importance all in the name of “infrastructure development”. While the natural “infrastructure” that had once provided continuing ecological services for large urban and rural areas in China was walking toward its death! Wujiang River is not at all alone! Other large rivers in China are suffering the same fate. Devastating disaster has befallen, or is befalling the Dadu River, Jinsha River, Lancang River, Minjiang River, and Xiangjiang River, as well as the Yellow and Yangtze Rivers, waterways that have nurtured Chinese civilization for thousands of years.

If “infrastructure” is the physical support for social production and household life, which is required for a society to survive and develop, then why can not we keep the natural, free-of-charge, and living “infrastructure” that has functioned for thousands of years, instead destroying it while simultaneously constructing mechanical and grey “infrastructure” at a huge cost, that in the end supplies the same service?

For flood control? A research team from Peking University found that, even if China were to remove all flood embankments, only 2.8% of the country might be flooded. To protect this 2.8% of land, we have invested almost RMB 100 billion annually in so-called flood control projects! What has worked for thousands of years, we are wasting. Year after year China has generated huge wealth through hard work. Isn’t this worth reflection by every Chinese citizen

and decision-makers in particular? In the agricultural era, 2.8% of national land supported agricultural livelihoods and the lives of tens of millions of people. In the early 20th century, at least 90% China’s GDP was from agriculture, and the production of each square meter of land was directly linked to the living standards of local people. This is no longer the case. Agriculture now contributes to less than 10% of China’s economy. We do not need to fight the floods for agricultural lands. The fact is, the flooding we now experience is the result of irrational planning and construction.

For power generation? Hydropower makes up only 15% of total power generation in China. In order to produce hydropower, we have destroyed, on a national scale, the most crucial “infrastructure” ecosystem of the world — the water and river system, and even the whole water system. Ironically, in order to get water, we designed the South-to-North Water Diversion Project, which with 13 cascade pumping stations and a total lift head of 65 meters diverts water from Yangtze River basin to Yellow River basin. How much power is needed to maintain the daily operation of such huge, national-scale infrastructure?

For addressing the water shortage in Northern China? People might not know that each year four billion cubic meters of rainwater is discharged into the sea from Beijing alone, while each year the South-to-North Water Diversion Project transfers only three billion cubic meters of water to Beijing. Each year, as summer turns into autumn, there is a fear of flood disasters in almost all cities in China. To deal with the volume of raining and flooding, our cities make huge investments to build large drainage pipelines and pumping stations, hoping to drain every drop of rain in the blink of an eye. If we could keep all the rainwater in Beijing, or even three quarters of the water, then there would be no need to transfer water from the south to the north. As huge, impenetrable infrastructure, the South-to-North Water Diversion Project has caused damage to natural and human processes, including damages to the urban and rural water system, cultural heritage, and tourist and community networks. It would be impossible to measure the ecological, social, cultural, and economic costs with simple numbers.

For addressing urban waterlogging? For thousands of years, our ancestors have gleaned rich lessons from the failures and successes of adapting to rain and

waterlogging through ecological infrastructure adapted to local climates. For example, the mulberry fishponds of the Pearl River Delta, the water network south of Yangtze River, small ponds in mountainous areas of southwest China, and ponding marshes in northern China are reminders of ecological infrastructure from ancient China. These landscapes have provided the best ecological services for generations, including food and clean water supply, rainfall flood regulation and storage, drought relief, disaster prevention, and life preservation, in the context of poetic and picturesque scenery. Nevertheless, our cities, consciously or unconsciously, ignore this type of ecological “infrastructure” but instead maneuver the pen of planning, produce mandatory legal documents, and advocate for machinery that moves mountains and empties the seas. Modern planning flattens the land, turns sites into pieces of blank paper, and lays out generic, grey “infrastructure”. It builds wide, broad roads and controlled networks of water supply, power supply, and sewage pipes. Systematic, free ecological infrastructure is replaced with a set of static infrastructure that provides a single function and costs a fortune. The results are right before our eyes: cities lose their resilience when faced with the extremes of natural processes.

For water pollution treatment? Our forefathers cherished human waste, collecting it as the best fertilizer for crops. Such agricultural treasures are treated by city-dwellers as wastewater and garbage, discharged through sewers into rivers and lakes, polluting waterways instead of fertilizing hungry farmlands. At the same time, farmers stopped making use of free organic fertilizers, and in order to maintain crop yields, turned to expensive inorganic fertilizers produced in factories that emit black toxic smoke and discharge poisonous sewage water. On the other side, in cities, engineers invented sewage treatment plants. Supported by large amounts of electricity and connected by innumerable pipes, these expensive machines are devoted to removing nutrients in sewage, often ignoring that their power source emits black smoke and kills living rivers. Such infrastructure cuts short the natural circulation of materials and metabolic systems, only to send water, soil and air pollutions into an unnecessary and redundant circle.

For providing transport service? We build highways so that cars can move

faster. We close the entrances and exits along these roads and construct isolation belts at the center to ensure that the highways — the backbones of infrastructure — are continuous and unobstructed. We are unaware however, that such actions have damaged another transportation network that was denser and more efficient, a transport means that is safer and greener: the pedestrian and bicycle system.

Please do not get me wrong. I am not advocating removal of cars, nor am I denying the technology that supports modern human civilizations. I am calling for a new type of infrastructure that is wiser, more sophisticated, and able to systematically integrate natural and human processes. I am calling for an ecological infrastructure that takes landscape as the infrastructure to systematically address the diseases of contemporary cities, to address regional and local flooding, drought and water shortage, water and soil pollution, alienation from nature, dullness of environmental experience, and lack of cultural identity. An ecologicalized infrastructure will bring us a new picture of cities: a poetic, picturesque, and resilient place that is fertile and resources-efficient, based on natural systems, rich in delicate human creations, and free of the turmoil of the world. This new type of infrastructure would bring us a new, low-carbon, healthful, and ecological life. Such infrastructure will help us in creating new cultures and guide us towards a new civilization — an ecological civilization.

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