# 引言

**环境公平性(Environmental Justice)**研究环境资源在不同群体间的分配结果是否存在差异,主要关注环境利益与环境风险在不同种族之间的不平等配置问题[1].随着我国社会经济发展,不同收入人群的环境福祉分配差异日渐显著,环境公平性问题突出[2][3][4].我国城市发展历史特殊、城市人口密集、城市化进程迅速,这三大特征使得人群获取城市生态系统服务效益的差异成为环境公平性研究的重要方面[5].环境公平性研究有利于缩小环境资源在不同人群中配置的不均衡性.

**生态系统服务(Ecosystem Services, ES)**指自然生态系统及其组份维系与支持人类生活的条件与过程[6]. 主要包括城市公园、居民花园、绿色屋顶、水体与行道树等城市绿色空间(Urban Green Spaces, UGSs)[7]提供的环境效益,具有缓解气候压力,供给市民休憩娱乐等效益[8]. 其中, **文化生态系统服务(Cultural Ecosystem Services, CES)**具有改善居民身心健康[9],提供生态保育设施[10]等正向作用,是城市生态系统服务的重要组成部分[11]. 随着我国的快速城市化进程, 城市居民对于城市生态系统服务的需求不断上升[8].但城市生态系统服务效益存在一定程度的分配不均[8] [12],体现在城市生态系统服务供需在不同空间,不同人群之间分配的不平衡. **生态系统服务供给与需求**分别对应生态系统基于其生物物理特性提供服务的潜力以及社会对于某种生态系统服务的供给在数量与质量上的需求[13]. 针对生态系统服务在空间分布上的不平衡, **生态系统服务制图**有助于决策者进行生态系统核算[14],规划城市景观格局[15],加强城市生态系统保护[16]等[17].同时, 评估文化生态系统服务供需在空间上的匹配程度,探索其空间分布特点,也是揭示环境公平性分配的重要步骤[18].

城市绿地对公共健康效益显著,其分配均衡性已被认为是一个环境公平问题[19][20].来自全球不同地区的研究证实:城市或村镇中低收入地区的人群获取城市生态系统服务的机会相对少[21][22][23][24][25]. 富裕地区如澳大利亚阿德莱德地区的居民获取城市生态系统服务的可能性约为其相邻欠发达地区的两倍[21].城市生态系统服务的主要效益常常被白人或富裕群体获得,且在不同年龄段,性别的人群中差异较大[22]. 不同人群对于生态系统服务可达性的差异已成为环境公平性研究关注的重点[8][27]. 然而,现有研究多关注于种族和收入之间的差异对于人群获取生态系统服务的影响,鲜有关注不同年龄段之间的环境公平性分配状况.而我国正处于人口老龄化的加速阶段,庞大的老年人群将成为城市生态系统服务的重要对象,结合生态系统服务供需匹配分析,评估其在不同年龄段人群中的配置特点有助于合理规划城市绿色空间,减少环境不公平引起的社会问题.

文化生态系统服务对于社会经济福利及居民身心健康的重要性吸引众多研究者开始关注自然景观的非物质效益[28]. 相关研究主要集中在如何衡量城市绿色空间（主要是城市公园）的使用情况;城市居民对城市绿色空间的利用现状;以及缺乏使用机会如何影响公共健康[19][20].目前,相关研究大多来自于美国、英国和澳大利亚,**针对我国国情的研究相对较少**.中国在改造城市绿地方面的经验可以为全球北方(gobal north)的城市提供重要的借鉴[8].上海作为我国经济中心之一,城市建设水平领先,评估其文化生态系统服务供需匹配,探索城市生态系统布局模式,对其他城市生态系统服务规划具有重要意义[39].

关于城市生态系统服务供需测度,目前还没有统一的度量标准[8].学者常用GIS方法度量其供给能力[28][30][31]. 如测算基础设施与居民点的距离、密度和缓冲区内公园面积等[32][33][34][35].单一GIS方法不足以捕捉公园的所有服务特点[30], ,且由于公园种类,大小,服务的人群不同所造成的异质性,使得供需评估更为困难[36].利用群众参与的方法改进生态系统服务需求评估;结合生态阈值进行生态系统服务供需分析;使用多尺度方法,综合考虑局部与区域规划及其交叉尺度的相互作用是改善生态系统服务供需分析的重要方法[37].

综上所述,本文针对上海市文化生态系统服务供需,结合遥感影像与社会经济数据,评估上海市文化生态系统服务供给能力与需求潜力;利用空间叠加分析等地理信息技术完成上海市文化生态系统服务制图,揭示其空间匹配现状,探索环境公平视角下,城市文化生态系统服务的规划现状,展望未来发展模式.

# 问题总结

* 本研究的空间尺度能达到什么程度:以街道为基本统计单元?栅格数据分辨率?
* 文献[29]已经做过上海类似的研究,我们的创新和改进能从哪些方面去考虑?(以内环外环作为市区与郊区的分界,改进简单单一中心城区为市区的划分方式?加入不同年龄段人群的需求分析,针对老龄化现状?)
* 依据什么标准,选择文化生态系统服务供给和需求的评价指标?能否考虑市区/郊区的差异?距离市中心的梯度?

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