

可持续消费、人类福利与环境影响：进展与问题

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摘 要: 可持续消费是实现全球可持续发展目标的关键内容之一。如何在增加人类福利的同时, 通过践行可持续消费模式以实现生态环境持续健康发展, 是我们迫切需要总结和讨论的重要议题。在系统梳理可持续消费概念、必备条件以及可持续消费效果评估的基础上, 综述了消费与人类福利的关系以及水足迹视角下消费的环境影响评估研究, 通过阐释人类福利、环境影响以及可持续消费模式之间的内在联系, 指明当前研究工作中存在的主要问题有: (1) 在可持续发展模式实践中, 缺少系统、科学、合理、针对性强、有效的“战略指导”和“战略引导”; (2) 缺少对可持续消费状态的系统评估和评判标准; (3) 虽明确了可持续消费模式优化的方向, 但个人实践可持续消费的潜在行为能力仍有待评估; (4) 宏观层面的可持续消费机制或约束机制较为缺乏、可持续消费实践研究相对缺位; (5) 可持续消费模式与可持续生计关联机制研究较为缺乏。最终反思提出未来应该在以下几个方面深入研究: (1) 明确可持续消费的战略定位, 完善顶层设计; (2) 深化对可持续消费的系统评估, 构建科学合理的可持续消费评估指标体系; (3) 加强个人实践在可持续消费中潜在行为能力的测度; (4) 深入研究宏观层面的可持续消费机制, 以推动可持续消费的实践发展; (5) 深入研究可持续消费模式与可持续生计关联机制, 达成脱贫与长期福利的双赢红利。

关键词: 可持续消费; 人类福利; 水足迹; 环境影响

Sustainable consumption, human well-being and environmental impacts: progress and issues

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Abstract: *Background, aim, and scope* Sustainable consumption plays a crucial role in achieving the objective of sustainable development on a global scale. With the increase of national income and social development, the growing consumption is regarded by the public as a sign of improved living standards and increased “welfare”.

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There is a kind of “morbid” in the society with unrestricted consumption, which impedes the sustainability of social development to some extent. Therefore, it is imperative to find a way to increase human welfare while ensuring the sustainable development of ecological environment through sustainable consumption. Based on a systematic analysis of sustainable consumption, preconditions and effect evaluation of sustainable consumption, this paper summarizes the correlation between consumption and human welfare and assesses the environmental impact of consumption from the perspective of water footprint. **Materials and methods** A review is conducted of the progress made over the past two decades both at home and abroad in the research on sustainable consumption, consumption and human welfare, and environmental impact. **Results** The excessive and unrestricted consumption of material may have a negative impact on the environment while putting additional strain on resources. A sustainable mode of consumption is a free consumption mode that meets the basic needs of human beings and provides them with the potential of development without affecting the carrying capacity of the earth. The construction of this mode is regarded as a significant method to improve human welfare. Establishing a scientific and rational mode of consumption and reducing some unsustainable consumption are conducive to progressively eliminating the possibility of ecological crisis and increasing human welfare. In the meantime, the purpose of preserving the ecological environment is achieved. **Discussion** Excessive consumption is bound to have a negative impact on the wider environment. That is to say, the increase of consumption will impose further strain on resources, environment and ecology. Therefore, the practice of sustainable consumption involves a number of core parties, which are consumers, government, enterprises and other stakeholders. They are expected to play a positive role in promoting the practice of sustainable consumption. In the meantime, changing the way of food consumption and reducing the proportion of non-sustainable consumption are not only conducive to preserving the ecological environment, but also to the long-term development of human society, thus increasing human welfare to a certain extent. **Conclusions** At present, there has been some remarkable progress and achievements made in the research on the environmental impact of sustainable consumption, human welfare and consumption. However, some problems remain unresolved. Firstly, in the practice of sustainable development, there is an absence of systematic, scientific, reasonable, targeted and effective “strategic guidance”. Secondly, there are no well-developed criteria that apply to the systematic assessment and evaluation of sustainable consumption. Thirdly, there is still no evaluation conducted regarding the potential behavioral capacity of individuals in the practice of sustainable consumption. Fourthly, at the macro level, there is an absence of sustainable consumption mechanism or restriction mechanism. Lastly, there is a lack of research on the associated mechanism between sustainable consumption and sustainable livelihood. In order to address the above-mentioned problems, the direction of research to be conducted in the future is indicated. **Recommendations and perspectives** The further research on sustainable consumption should be focused on the following points. Firstly, the strategic positioning of sustainable consumption shall be clarified and the top-level design shall be improved. Secondly, the systematic assessment of sustainable consumption ought to be deepened and a scientific and reasonable index system shall be put in place for the assessment of sustainable consumption. Thirdly, the measurement of the potential behavioral capacity of individual practice in sustainable consumption needs to be strengthened. Fourthly, the mechanism of sustainable consumption at the macro level shall be studied in depth to promote the practice of sustainable consumption. Lastly, the correlation mechanism between sustainable consumption and sustainable livelihood shall be established.

Key words: sustainable consumption; human welfare; water footprint; environmental impact

伴随着经济社会的发展,更多的物质资料消费和更多社会财富的占有逐渐成为人们人生成功的标签和幸福的符号(何小青,2007)。但无节制甚至不合理消费的存在,也给生态环境带来了极大的破坏,从而降低了人类福利(Durning, 1994)。通常来讲,消费增加能够使人们购买商品或服务的种类不断增加,从而使经济中的消费个体拥有获得感或享受服务、使消费个体的福利得到提高(丁志帆和孔存玉,2019)。事实上,消费不仅是单一物质消费的过程,而且是社会关系和人与自然关系的反映(Ding, 2012; 苏芳等, 2018)。当自然资源在人类活动的过程中过度消耗或超出了自然环境的承载力时,生态系统就会在一定程度上发生质的改变,从而对消费模式产生负反馈作用(尚海洋和丁杨,2017)。因此,可持续消费是改变粗放式生产以及不可持续消费模式的必然选择,其可以促进人类与生态环境、社会的互惠互利、和谐发展(赵国平,2019; Govindana et al, 2019)。如何引导消费向可持续生活方式转变,对处在高速发展的发展中国家,特别是中产阶级迅速成长的国家(如我国)尤为重要。本文在系统梳理可持续消费、消费与人类福利的关系、消费对环境的影响评估最新研究进展的基础上,深入挖掘了三者之间的内在联系以及当前研究工作中存在的问题,并反思提出未来的重点研究方向,以期促进人类与生态环境、社会的互惠互利与和谐发展。

1 可持续消费研究的新进展

1.1 “可持续消费”概念的提出

“可持续消费”最初在1992年6月里约热内卢联合国环境与发展会议上提出。随后,联合国环境署(UNEP, United Nations Environment Programme)于1994年发表《可持续消费的政策因素》报告,将可持续消费定义为“提供服务以及相关的产品以满足人类的基本需求,提高生活质量,同时使自然资源和有毒材料的使用量最少,使服务或产品的生命周期中所产生的废物和污染物最少,从而不危及后代的需求”(UNEP, 1994)。到20世纪90年代中期,生态经济学促进了有关于消费的研究。1996年,欧洲召开的首届生态经济会议上,可持续消费的有关研究与报告成为会议热点内容之一(Duchin, 1983; Duchin,

1994a, 1994b; Duchin, 1995),并有多篇会议论文发表在国际生态经济学旗舰期刊Ecological Economics上(包括1999年的专刊),从而使可持续消费成为生态经济领域的重要研究范畴。此后,Elizabeth Shove开创了欧洲关于消费与环境的网络化研究,并在美国(McCollough, 2012; Banbury et al, 2012; Cohen et al, 2013)和欧洲其他国家(Tseng et al, 2016; Govindana et al, 2019)掀起了有关可持续消费的研究热潮。

2012年6月,在巴西召开的联合国可持续发展大会(United Nations Conference on Sustainable Development,即“里约+20”峰会),政府领导、企业代表与民间团体就如何更好地理解 and 促进可持续消费与生产达成新的共识,倡导在今后十年内积极推进确定可持续消费研究的关键科学问题、评估区域与全球的可持续消费状态、共享可持续消费实践经验、转变可持续消费模式与机制、推广区域与全球可持续消费成果等方面的工作(Panzone et al, 2013)。此次峰会也发起了“全球可持续生产和消费研究论坛”(GRF-SPaC, the global research forum on sustainable production and consumption),这项论坛使GRF-SPaC成为可持续消费和生产(SPAC)领域研究人员和实践者的全球网络,还制定了“绝对减少”框架,即REDUCTIONS(reducing environmental degradation & unsustainable consumption trends & impacts on nature & society)计划,并在区域与全球尺度上全面展开可持续消费研究(Vergragt et al, 2014)。

1.2 可持续消费的必备条件

可持续消费是通过管理机构的有效措施,改变消费的逻辑、调整促进消费的社会与物质基础(Norman et al, 1999)。比较有代表性的成果是Akenji(2014)综合消费者的偏好、商品与服务协调方、可持续生活方式的物质基础这三方面因素,开发的用于设计与分析可持续消费政策的“态度-推动者-基础设施”(AFI, attitude-facilitator-infrastructure)分析框架(Akenji, 2014)(图1)。

如图1所示,可持续消费的实现有三个必备条件:一是参与者正确的偏好(受价值观与知识影响);二是将偏好转为行动的协调方;三是可持续的物质基础(包括供给系统和基础设施)。这三个必备条件转化成社会主体,就可以将其理解为消费者(参与者)、政府(协调方)、企业(供

给系统和基础设施)。在促进可持续消费的实践上,应该认识到政府、企业和消费者是可持续消费实践的核心利益相关者(Xu et al, 2018)。因此,应从不同利益相关者的角色及其之间的关系深入研究,具体表现在:(1)政府方面,应通过制定强力有效的可持续消费政策促进有效的技术吸收和行为改变(Schroeder and Anantharaman,

2017; Dawkins et al, 2019);(2)企业方面,应加强展示可持续产品的环保性能,将耐用产品的寿命延长,激发人们对可持续产品的购买欲(Nazzal et al, 2013; Geng et al, 2017);(3)消费者方面,应加强自身的可持续性消费知识,逐步转向绿色消费模式(龙成志和卿前龙, 2017)。

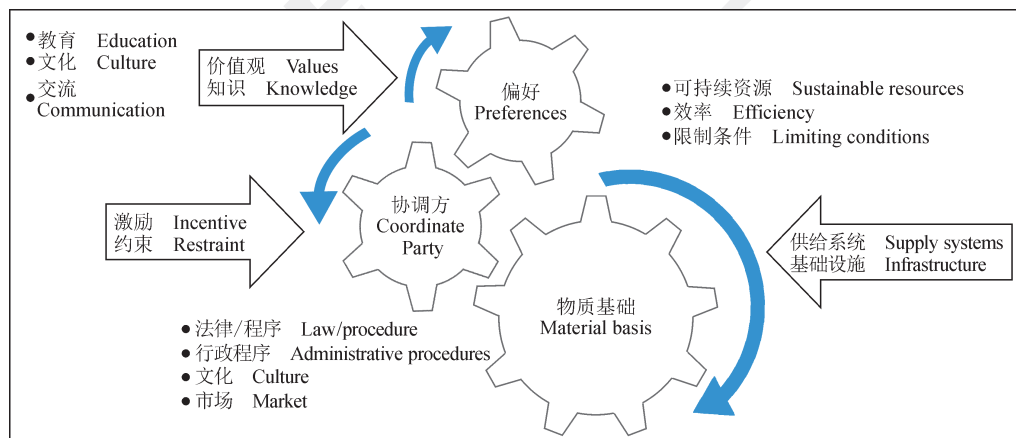


图 1 可持续消费转变概念模型

Fig.1 conceptual model of sustainable consumption transformation

1.3 可持续消费的效果评估

随着可持续消费实践的逐渐推进,人们逐渐认识到要想正确把握可持续消费状况、指导可持续消费发展,离不开对可持续消费的合理评估。Saaty (1980) 提出了用于可持续消费评估的层次分析法 (AHP, analytic hierarchy process)。之后很多学者借鉴此方法,建立了相应的指标体系来对可持续消费进行评估,如从经济、社会、环境构造出经济、社会和环境三要素指数体系(李祝平, 2012; 倪鼎文等, 2015); 周成西 (2009) 通过添加“资源”以及“消费支撑”要素,构造出经济、社会和环境、资源、消费支撑的五要素指数体系。现有研究通过构建消费者行为研究框架 (SCB-cube, sustainable consumption behavior-cube) 以及三维立方体模型 (Geiger et al, 2018) 有效评估个人层面的可持续消费。随后, Fischer et al (2017) 选择量表评估方法,提出了青年消费者可持续消费行为量表 (YCSCB, young consumers' sustainable consumption behavior)。

2 消费与人类福利的关系

2.1 福利的概念与评价

考虑到“福利”(也被称为“福祉”)被定义为对生活的满足与感受到的幸福(李静和白江, 2016)。可持续消费只有在保证消费者福利不断提高的同时,降低消费的环境影响后果才有意义,而非为了减少自身的环境压力尽可能地不消费而为他人提供更多的消费空间(诸大建和张帅, 2014)。生态系统所提供的产品与服务,以及教育、制度、可获得技术等因素,增加了人类的幸福感和满意程度,共同影响着人类福利(刘君言, 2017)。而安全感、良好生活的物质基础,健康、良好的社会关系及选择的自由等部分,也共同构成了人类福利(赵士洞和张永民, 2006)。由此看来,文化与社会经济环境是人类福利存在的基础,也是影响人们更舒适生活的至关重要的因素。

20 世纪中后期开始,研究人员先后开发了一些测量指标来评价人类福利,如“经济福利指标”(Daly and Cobb, 1989)、“可持续经济福利”

(Daly and Cobb, 1989)、“Calvert-Henderson 生活质量指数”(Henderson et al, 2000)等,这些指标的采用都基于一个共同的基本假设,即消费能带来更大福利。由于人类需求具有多层次性,越来越多的人认识到消费与幸福或生活质量并没有直接的联系。其中,消费作为反映人类福利的客观指标,而生活质量或幸福是作为人类福利的主观指标。基于此,部分学者尝试探索对人类福利的定量评估,如:Max-Neef 基于人类需求矩阵来评价人类需求(HNA, human needs assessment),提出分离消费和福利以直接评估人类基本需求满足程度,并用它作为人类福利的测量指标(Max-Neef, 1992);随着1972年“国民幸福指数”(GNH, gross national happiness)的提出(Jigmi, 2005),全球掀起了关于福利的研究热潮(程国栋等, 2005; Feldman, 2010; Russell, 2012),并通过创办 Journal of Happiness 期刊来专门探讨福利问题。

2.2 消费对于人类福利的影响

传统经济学理论认为,经济消费水平的提高会导致福利水平的提高(Jackson and Marks, 1999),消费增长能够提高居民消费进而改善人类福利(丁志帆和孔存玉, 2019)。随着消费品种类的增多以及消费方式的多样化,消费者会从消费的过程中获得福利感受(银辉, 2017)。然而,这种观点受到了环境和社会两方面的批评。一方面,过多物质消费的影响对环境是不可持续的(Jackson and Marks, 1999),由于人类的物质消费或服务是由不同的生态系统提供,因而其福利受到不同生态系统供给变化的影响(傅伯杰等, 2009),在消费过程中,人们对资源的过度开发、不当使用,导致生态中某种资源(如水资源)供不应求,就会带来很大的环境污染和灾害,使环境问题变得更加严峻(朱迪, 2016)。另一方面,物质消费可能与人类福利的关键社会和心理成分相冲突(Jackson and Marks, 1999)。人类如果为了满足自身福利而直接或间接地过度消费生态系统服务,很可能造成生态系统的退化和破坏(MA, 2005),而生态系统破坏后人类福利随之下降,这种不可持续的发展模式就会恶性循环,引起严重的人类福利危机(Govindana et al, 2019)。反之,如果人类合理地、有节制地消费生态系统服务,改变粗犷的不可消费模式,则可不断提高人类福利(赵国平, 2019),同时,福

利的提高也会在一定程度上保护生态系统(MA, 2005),促成可持续发展的良性循环(王大尚等, 2013)。

尤其对于很多正在消除贫困的国家,在经济发展的同时更应该关注消费对生态系统和人类长期福利的影响,主要由于其大多数贫困地区与生态脆弱区在空间分布上都存在不同程度的一致性(陈成文和廖欢, 2016)。在我国四川省若尔盖湿地连片贫困区内,由于人们过度追求物质产品价值、过度利用草原生态供给,导致该地区出现了严重的生态破坏,使草原湿地的生命支持功能出现了消退、减弱现象,严重影响了当地的物质产品生产,影响了人们的正常生活(张晓云等, 2009);在南非地区,由于人们对当地木材消费的持续增加,大量的人工种植林兴起,致使河流径流量持续减少,引起了严重的水资源供给和消费问题,从而制约了当地经济发展、制约了其长期福利的提高(Chisholm, 2010)。可见,贫困地区在发展过程中如果过度强调物质消费带动经济发展、资源过度利用等,则会使该地区生态破坏,从而阻碍该地区的可持续发展,带来“返贫”危机,降低了长期福利(陈成文和廖欢, 2016)。仅仅关注消费等经济指标无法恰当地评估人类福利(王大尚等, 2013),经济发展、物质消费提高只是人类福利表现的局部,走可持续发展模式,从整体上提高人类福利才是其核心所在(Smith et al, 2013; Costanza et al, 2014)。

据联合国发布的《世界人口展望》预测,过去几十年世界人口迅猛增长,预计将在2050年(可能会更早)突破90亿(UN, 2015)。人均消费也伴随着人口剧增而快速增长,直接的后果是人类对自然资源的需求量(特别是一些关键性资源如水资源)迅速增加,接近或已经超过了可持续发展的上限——即维持生态系统自身的最小生态安全值。因此,遏制人类的不当消费,改变原有不当的消费模式,走可持续消费之路,是保护环境、为社会带来福利的一个重要举措(杜延军, 2013)。

3 水足迹视角下消费的环境影响评估

消费是引发生态环境问题的重要原因之一(Cogoy, 2009)。面对21世纪人类面临的最为严峻的现实问题——水资源危机,实现水安全目标,对很多水资源较为匮乏的国家或地区尤为迫切(程国栋, 2003)。水足迹理论通过识别人类

生产或消费行为对水资源的消耗和污染来衡量产品的水资源利用效率,揭示产品全生命周期水资源消费情况(Chico et al, 2013),可作为判断某产品对当地水资源和水环境影响情况的有效依据,已得到广泛应用。

3.1 水足迹评估方法与特性比较

水足迹是衡量用水情况的一个指标,既包括消费者的直接用水,也包含间接用水,能够真实地反映某地区一定人群消费所耗费的水资源情况,为水资源科学管理研究提供了新的视角(Hoekstra et al, 2011)。目前国际和国内较为流行的水足迹评估方法主要有以下三种:(1)基于水足迹网络方法(WFN, water footprint network),通过衡量水消耗的蓝水足迹和绿水足迹,以及水污染的灰

水足迹来对整个水足迹进行评估,是消费者或生产者直接和间接使用水资源的衡量指标(Hoekstra et al, 2011; 任晓晶等, 2018);(2)生命周期评估法(LCA, life cycle assessment),提供了有关商品、服务的生产、流通、处置过程中水足迹的更详细、全面、深入的分析,使得整个水足迹评估更为全面和详细(Duchin, 2005);(3)投入产出分析法(IOA, input-output analysis),通过部门之间生产关系流动的细节,将整个经济活动中的生产者、消费者联系在一起,可以追溯产品在全产业链上的水资源消耗情况(Leontief, 1970)。随着环境与水足迹理论的发展,不同的水足迹评估方法在不同情境下各有不同,其优缺点和适用性如表 1 所示。

表 1 水足迹评估方法及其特性比较

Tab.1 Comparison of water footprint assessment methods and characteristics

方法 Methods	优点 Advantages	缺点 Disadvantages	适用性 Applicability	数据来源 Reference
基于水足迹网络法 WFN method	原理简明、操作性强,水足迹核算结果具有直观的可比性。 Principle of concise, high maneuverability, water footprint calculation results comparable with intuitive.	存在遮蔽效应,对水资源消耗和水污染的潜在环境影响缺乏关注。 There is a masking effect and a lack of attention to the potential environmental impacts of water consumption and water pollution.	适用于食品、化工、纺织、造纸、养殖等多个行业。 Suitable for food, chemical, textile, paper, breeding, and other industries.	Hoekstra et al, 2011; 任晓晶等, 2018 (Ren X J et al, 2018)
生命周期评估法 LCA method	划分详细,评估过程强调水足迹的“影响”,对水污染评价划分较详细。 The assessment process emphasizes the “impact” of water footprint, and the water pollution assessment is divided in detail.	由工业产品推广到行业、地区和国家级别时,数据不可获得,计算复杂。 When industrial products are promoted to industry, regional and national levels, data are not available and calculations are complex.	适用于分析公司或产品特别是农产品级别的水足迹。 Suitable for analyzing the water footprint of companies or products, especially agricultural products.	Hoekstra and Chapagain, 2007; Duchin, 2005; 江永楷, 2015 (Jiang Y K, 2015)
投入产出分析法 EIO method	简单、数据要求低,较全面、系统。 Simple, low data requirements, more comprehensive, system.	数据不全面;不能处理实际的多产品系统。 Incomplete data; Unable to handle real multi-product systems.	广泛运用于环境足迹评价领域。 It is widely used in the field of environmental footprint assessment.	Leontief, 1970; 江永楷, 2015 (Jiang Y K, 2015)

同时,水足迹模型从多个要素对特定区域社会群体生活消费所需的水资源量进行综合分析,可以真实地反映出所测算区域的消费结构和水资源利用效率,对消费结构及消费模式的优化和转变提供了新思路(龙爱华等, 2005; Hoekstra and

Mekonnen, 2012; Shang, 2015)。常用的水足迹模型如 IPAT 等式和 IHPACT 等式,其中经典的 IPAT 等式,即 $I = PAT$,该等式表达了环境影响(I)的产生,是人口(P)、富裕度(A,或理解为收入)和技术(T)的综合作用(Ehrlich

and Holdren, 1971); 而 IHPACT 等式是通过 IPAT 等式扩展而来的, 即 $I=HPACT$, 其中扩展的 H 为消费组群特征; C 为影响强度。该等式研究发现环境 Kuznets 曲线假说在消费能力与消费的环境影响之间同样适用, 当消费能力达到某个峰顶或达到一定水平时, 消费的环境影响随着消费的增加而下降, 佐证了低水消费模式存在的可能性与必要性(尚海洋和丁杨, 2017)。

3.2 水足迹视角下食物消费的环境影响评估

由于食物是人类赖以生存和发展的基础, 食物消费既成为人类满足最基本需求的一种消费活动, 也是家庭可持续消费的核心问题(Friel et al, 2014)。因此, 水足迹视角下探讨居民食物消费对环境的影响程度, 对推进可持续消费实践的发展具有十分重要的意义。

食物消费水足迹是指消费者消费各类食物的实体水和虚拟水之和, 也就是其消费过程中所消费食物所需(消耗或污染)的淡水量总和(丁杨, 2018)。目前, 由于人口规模的不断扩大和食物消费结构的变化, 使得居民食物消费水足迹不断上升(郑翔益等, 2019)。居民食物消费结构变化主要是由消费的蔬菜类偏多不断转向消费更多的肉、蛋和水产品等, 这些变化导致了食物消费水足迹不断增加, 同时带来了严重的资源与环境污染问题(黄季焜, 1999)。多数学者一致倡导个人减少对肉类、烘烤类食物的消费量, 既有助于身体健康, 又是转变生活方式、实现可持续消费简单而行之有效的措施(Vanham, 2013; Grabs, 2015; 郑翔益等, 2019)。Vanham (2013)在对澳大利亚常规饮食模式进行核算的基础上, 基于德国营养协会(DGE, German Nutrition Society)的健康饮食模式, 提出了构建素食主义饮食模式, 即在能量与蛋白质摄入量保持不变的情况下, 其饮食结构需要从肉蛋禽类食物向豆、坚果等富含纤维的食物转变(DGE, 2012; Vanham, 2013)。同样, 在饮食结构方面, 驱动水足迹上升的一个重要因素是居民的食物消费结构向肉类禽蛋类消费转移(郑翔益等, 2019)。因此, 应构建食物生态承载级别衡量标准, 建立科学的可持续食物消费模式, 优化食物消费结构, 增加谷物、蔬菜等纤维性食物的消费和摄入量, 这可在一定程度上促使人均生态足迹下降, 减缓环境压力(林永

钦等, 2019)。

4 问题与讨论

可持续消费模式可被定义为一种能够满足基本消费需求且不会对生态环境产生恶劣影响的模式, 它拥有让人类自由发展的潜力, 且可以在全球推广而不会影响到地球的承载能力(Khalili et al, 2011)。相反, 无节制的消费社会正表现出一种“病态”, 制约着社会的可持续发展。这种不可持续性的活动对地球的生态系统、自然进程、平衡稳定等干扰在不断加大(王丽和王建力, 2004), 环境污染的不断加重以及生态服务功能持续减弱, 资源上限、环境底线和生态安全时刻严重制约着人类社会的可持续发展, 降低人类的长期福利(樊杰等, 2013)。尽管现在环保科技、政策、可持续生产等发展对可持续实践与发展有着很大的助推作用, 但人们固有的消费模式如果不加以改变, 其作用也将大打折扣(Peattie, 2010)。现有研究在可持续消费模式实践、消费与福利的关系及食物消费水足迹下的饮食结构等方面均取得了重要进展, 极大地促进了社会的可持续发展研究。但可持续消费实践的推进仍然面临着一些问题亟待解决和完善, 主要表现在:

(1) 在可持续发展模式实践中, 缺少系统全面、科学合理、针对性强、有效的“战略指导”和“战略引导”。现存物质消费主义泛滥思想较为普遍, 其在短期内能够对消费经济起到一定的刺激作用, 但长期来看, 这种消费模式对环境的影响较大。如何通过宏观层面的战略引导, 促使物质密集型消费社会转向一个物质欲望较少的社会, 是值得深入思考的问题。与欧洲、北美洲等国家相比, 我国“实现可持续消费转变”的行动相对迟缓, 这与我国在可持续消费的战略定位、顶层设计是密切相关的(李霞等, 2014)。未来应明确可持续消费的宏观战略定位, 完善顶层设计, 制定切实可行的可持续消费政策, 以有效促进可持续消费实践。

(2) 现有研究缺少对可持续消费状态的系统评估, 缺乏判定消费是否为可持续的科学依据。而推动可持续消费实践的关键环节, 就是要建立科学合理的可持续消费评估指标体系(周成西, 2009)。目前, 学者们通过层次分析、模型构建、工具效应、量表等方面对可持续消费状态展开了

初步研究,各学者所选取的要素不同,其评估结果也会有所差异。在可持续消费状态的系统评估方面,较为系统的评估指标还较为缺乏,未来应深化对可持续消费的系统评估,构建科学合理的可持续消费评估指标体系,以促进可持续消费实践。

(3) 目前研究虽明确了可持续消费模式优化的方向,但个人实践可持续消费的潜在行为能力仍有待评估。消费者个人在实现政府降低能源消耗、实现绿色生活方式、创造可持续社会等方面可发挥关键作用(McDonald et al, 2012)。但由于受到短期利益或是眼前利益的影响,虽然大部分消费者对于可持续问题是抱着积极态度,但其实际的消费行为却与态度有着很大的反差(王万竹等, 2012)。从目前的发展趋势来看,消费者的收入水平、受教育水平、对品质消费的追求、对环境的关注度等都在提高,这些因素已成为普及可持续消费的基础(裴亮, 2019),未来应加强个人实践在可持续消费实践过程中潜在行为能力的评估,针对如何减少意识与行动差异,个人在哪些方面如何去行动,如何培养提高个人消费的质量潜力等问题展开深入的探讨。

(4) 目前的可持续消费实践研究,主要聚焦于微观家庭、个体层面,相对应的宏观层面如集体性、社会性的消费实践研究却较为缺乏(范叶超, 2017),缺少对可持续消费机制或约束的探讨。事实上,在可持续消费实践中,三个重要的核心主体,即消费者、政府、企业及其他主体也都需要发挥其积极作用,推动可持续消费实践的发展。从社会性、集体性层面来说,政府、企业在可持续消费实践方面至关重要。因此,宏观层面的环境引导和机制约束对于可持续消费实践的发展具有一定的助推作用。目前,尽管世界各国都能意识到现有环境危机的核心即不可持续消费,然而从可持续消费意识的觉醒到建立科学且有效的全球可持续消费模式,还需要大量的实践与研究去推动。

(5) 现有研究较少将可持续消费模式与贫困地区可持续生计相关联。为了提高经济发展水平,较为落后、欠发达的贫困地区不断对地区优势资源过度开发利用、不断刺激物质消费,最终陷入“贫困—无节制资源消费—生态破坏—贫困”的

恶性循环之中。解决此类动态贫困问题,一方面,贫困群体要主动“社会参与”,树立可持续消费意识,节制资源利用和消费;另一方面,政府、企业、消费者等主体可将农副等扶贫产品作为可持续消费产品,形成积极的消费刺激,构建可持续消费与可持续生计的关联机制,从而促进消费模式与扶贫领域关联的红利效应。

人与自然是生命共同体,人类只有通过形成节约资源和保护环境的空间格局、产业结构、生产生活方式,才能实现长期的“美丽”和“健康”。因此,建立科学且合理的消费模式,减少部分非持续性消费,可在保护生态环境的同时,逐步消除生态危机,增加人类福利。减少生活的物质挥霍有利于环境,更有利于人类。从人文主义的立场,可持续消费可以提供重要“双重红利”:消费更少,生活更好。

参考文献

- 陈成文, 廖欢. 2016. 精准扶贫: 一个概念的社会学意义及其政策启示 [J]. 开发研究, (4): 71–76. [Chen C W, Liao H. 2016. Targeted poverty alleviation: the sociological significance of a concept and its policy implications [J]. *Research on Development*, (4): 71–76.]
- 程国栋, 徐中民, 徐进祥. 2005. 建立中国国民幸福生活核算体系的构想 [J]. 地理学报, 60(6): 883–893. [Cheng G D, Xu Z M, Xu J X. 2005. Vision of integrated happiness accounting system in China [J]. *Acta Geographica Sinica*, 60(6): 883–893.]
- 程国栋. 2003. 虚拟水——中国水资源安全战略的新思路 [J]. 中国科学院院刊, 17(4): 260–265. [Cheng G D. 2003. Virtual water—a strategic instrument to achieve water security [J]. *Bulletin of Chinese Academy of Science*, 17(4): 260–265.]
- 丁杨. 2018. 张掖市居民食物消费水足迹核算与分析 [D]. 兰州: 兰州财经大学. [Ding Y. 2018. Accounting and analysis of water footprint on residents' food consumption in Zhangye City [D]. Lanzhou: Lanzhou University of Finance and Economics.]
- 丁志帆, 孔存玉. 2019. 消费增长与消费平等的福利比较——基于城镇分组消费数据的数值模拟分析 [J]. 消费经济, 35(1): 41–48. [Ding Z F, Kong C Y. 2019. The welfare comparison of consumption growth and consumption equality—based on numerical simulation

- analysis of urban group consumption data [J]. *Consumer Economics*, 35(1): 41–48.]
- 杜延军. 2013. 可持续性消费评价指标体系及综合评价模型 [J]. *生态经济*, 29(8): 73–76. [Du Y J. 2013. The index system & comprehensive evaluation model on sustainable consumption [J]. *Ecological Economy*, 29(8): 73–76.]
- 樊杰, 周侃, 孙威, 等. 2013. 人文-经济地理学在生态文明建设中的学科价值与学术创新 [J]. *地理科学进展*, 32(2): 147–160. [Fan J, Zhou K, Sun W, et al. 2013. Scientific values and research innovations of human-economic geography in construction of ecological civilization [J]. *Progress in Geography*, 32(2): 147–160.]
- 范叶超. 2017. 社会实践论: 欧洲可持续消费研究的一个新范式 [J]. *国外社会科学*, (1): 95–104. [Fan Y C. 2017. Social practice: a new paradigm of sustainable consumption in Europe [J]. *Social Sciences Abroad*, (1): 95–104.]
- 傅伯杰, 周国逸, 白永飞, 等. 2009. 中国主要陆地生态系统服务功能与生态安全 [J]. *地球科学进展*, 24(6): 571–576. [Fu B J, Zhou G Y, Bai Y F, et al. 2009. The main terrestrial ecosystem services and ecological security in China [J]. *Advances in Earth Science*, 24(6): 571–576.]
- 何小青. 2007. 消费伦理研究 [M]. 上海: 上海三联书店. [He X Q. 2007. Research on consumer ethics [M]. Shanghai: Shanghai Sanlian Bookstore.]
- 黄季焜. 1999. 社会发展、城市化和食物消费 [J]. *中国社会科学*, (4): 102–116. [Huang J K. 1999. Social development, urbanization and food consumption [J]. *Social Sciences in China*, (4): 102–116.]
- 江永楷. 2015. 中国各地区及工业行业水-碳足迹核算及情景模拟研究 [D]. 北京: 清华大学. [Jiang Y K. 2015. Water-carbon footprint accounting and scenario simulation study of China's regions and industrial sectors [D]. Beijing: Tsinghua University.]
- 李静, 白江. 2016. 新型城镇化对社会福祉提升的影响分析 [J]. *求是学刊*, 43(5): 62–68. [Li J, Bai J. 2016. Analysis of the influence of new type of urbanization on social well-being—enlightenment dialectics of late-developed counties [J]. *Seeking Truth*, 43(5): 62–68.]
- 李霞, 彭宁, 周晔. 2014. 国际可持续消费实践与政策启示 [J]. *中国人口·资源与环境*, 24(5): 46–50. [Li X, Peng N, Zhou Y. 2014. International practice and policy implications of sustainable consumption [J]. *China Population, Resources and Environment*, 24(5): 46–50.]
- 李祝平. 2012. 湖南城镇居民可持续消费评估分析 [J]. *长沙理工大学学报(社会科学版)*, 27(3): 79–84. [Li Z P. 2012. Evaluation and analysis of sustainable consumption of urban residents in Hunan [J]. *Journal of Changsha University of Science & Technology (Social Science)*, 27(3): 79–84.]
- 林永钦, 齐维孩, 祝琴. 2019. 基于生态足迹的中国可持续食物消费模式 [J]. *自然资源学报*, 34(2): 338–347. [Lin Y Q, Qi W H, Zhu Q. 2019. Chinese sustainable food consumption pattern based on ecological footprint model [J]. *Journal of Natural Resources*, 34(2): 338–347.]
- 刘君言. 2017. 包容性生态财富核算研究 [D]. 北京: 中国社会科学院研究生院. [Liu J Y. 2017. Research on accounting of inclusive ecological wealth [D]. Beijing: Graduate School of Chinese Academy of Social Sciences.]
- 龙爱华, 张志强, 徐中民, 等. 2005. 甘肃省水资源足迹与消费模式分析 [J]. *水科学进展*, 16(3): 418–425. [Long A H, Zhang Z Q, Xu Z M, et al. 2005. Analysis of water footprint and consumption pattern in Gansu Province [J]. *Advances in Water Science*, 16(3): 418–425.]
- 龙成志, 卿前龙. 2017. 消费者可持续性知识对绿色消费行为的影响——以品牌可持续性感知为中介 [J]. *中国流通经济*, 31(7): 91–102. [Long C Z, Qing Q L. 2017. Research on the influence of consumer sustainability knowledge on sustainable consumption with the mediating role of brand sustainability perception [J]. *China Business and Market*, 31(7): 91–102.]
- 倪鼎文, 尚海洋, 刘正汉. 2015. 居民可持续消费评价研究——以甘肃省张掖市为例 [J]. *生产力研究*, (5): 95–99. [Ni D W, Shang H Y, Liu Z H. 2015. Evaluation of sustainable consumption of residents—a case study of Zhangye City, Gansu Province [J]. *Productivity Research*, (5): 95–99.]
- 裴亮. 2019. 做可持续消费的行动派 [J]. *可持续发展经济导刊*, (S2): 51–52. [Pei L. 2019. Be an actor in sustainable consumption [J]. *China Sustainability Tribune*, (S2): 51–52.]
- 任晓晶, 白雪, 刘丹, 等. 2018. 水足迹评价方法对比及案例研究 [J]. *水利经济*, 36(6): 14–19, 71. [Ren X J, Bai X, Liu D, et al. 2018. Comparison and case study of assessment methods for water footprints [J]. *Journal of*

- Economics of Water Resources*, 36(6): 14–19, 71.]
- 尚海洋, 丁 杨. 2017. 基于 IHPACT 等式的可持续消费分析——以水足迹视角下张掖市低水消费模式为例 [J]. *冰川冻土*, 39(4): 910–916. [Shang H Y, Ding Y. 2017. Analysis framework of sustainable consumption based on IHPACT: take the low water consumption pattern in Zhangye Prefecture in the perspective of water footprint as a case [J]. *Journal of Glaciology and Geocryology*, 39(4): 910–916.]
- 苏 芳, 尚海洋, 丁 杨. 2018. 水足迹视角下低水消费模式研究——以黑河流域张掖市居民消费为例 [J]. *冰川冻土*, 40(3): 625–633. [Su F, Shang H Y, Ding Y. 2018. Study on the low water consumption patterns from the perspective of water footprint: take Zhangye Prefecture residents' food consumption as a case [J]. *Journal of Glaciology and Geocryology*, 40(3): 625–633.]
- 王大尚, 郑 华, 欧阳志云. 2013. 生态系统服务供给、消费与人类福祉的关系 [J]. *应用生态学报*, 24(6): 1747–1753. [Wang D S, Zheng H, Ouyang Z Y. 2013. Ecosystem services supply and consumption and their relationships with human well-being [J]. *Chinese Journal of Applied Ecology*, 24(6): 1747–1753.]
- 王 丽, 王建力. 2004. 全球变化研究与人地关系地域系统研究的统一 [J]. *热带地理*, 24(4): 301–305. [Wang L, Wang J L. 2004. The unification of global-change and man-earth areal system study [J]. *Tropical Geography*, 24(4): 301–305.]
- 王万竹, 王京安, 金 晔. 2012. 可持续消费态度和行为差异成因探讨 [J]. *生态经济 (学术版)*, (1): 12–15, 37. [Wang W Z, Wang J A, Jin Y. 2012. Study on attitude-behavior gap of sustainable consumption [J]. *Ecological Economy*, (1): 12–15, 37.]
- 银 辉. 2017. 全球化时代消费者视角的幸福经济学研究述评 [J]. *技术经济与管理研究*, (8): 89–93. [Yin H. 2017. Happiness economics of consumers' perspective in the era of globalization: a summary review of the literature [J]. *Technoeconomics & Management Research*, (8): 89–93.]
- 张晓云, 吕宪国, 沈松平. 2009. 若尔盖高原湿地生态系统服务价值动态 [J]. *应用生态学报*, 20(5): 1147–1152. [Zhang X Y, Lü X G, Shen S P. 2009. Dynamic changes of Ruorgai Plateau wetland ecosystem service value [J]. *Chinese Journal of Applied Ecology*, 20(5): 1147–1152.]
- 赵国平. 2019. 试论可持续消费模式的三重理论纬度 [J]. *经济研究导刊*, (30): 1–2. [Zhao G P. 2019. On the triple theoretical dimensions of sustainable consumption model [J]. *Economic Research Guide*, (30): 1–2.]
- 赵士洞, 张永民. 2006. 生态系统与人类福祉——千年生态系统评估的成就、贡献和展望 [J]. *地球科学进展*, 21(9): 895–902. [Zhao S D, Zhang Y M. 2006. Ecosystems and human well-being: the achievements, contributions and prospects of the millennium ecosystem assessment [J]. *Advances in Earth Science*, 21(9): 895–902.]
- 郑翔益, 孙思奥, 鲍 超. 2019. 中国城乡居民食物消费水足迹变化及影响因素 [J]. *干旱区资源与环境*, 33(1): 17–22. [Zheng X Y, Sun S A, Bao C. 2019. Urban and rural water footprints for food consumption in China and governing factor analysis [J]. *Journal of Arid Land Resources and Environment*, 33(1): 17–22.]
- 周成西. 2009. 基于 AHP 法的可持续消费评估指标体系设计研究 [J]. *商场现代化*, (12): 31–32. [Zhou C X. 2009. Design and research of sustainable consumption evaluation index system based on AHP [J]. *Market Modernization*, (12): 31–32.]
- 朱 迪. 2016. 我国可持续消费的政策机制: 历史和社会学的分析维度 [J]. *广东社会科学*, (3): 213–222. [Zhu D. 2016. Policy mechanism of sustainable consumption in China: historical and sociological analysis [J]. *Social Sciences in Guangdong*, (3): 213–222.]
- 诸大建, 张 帅. 2014. 生态福利绩效及其与经济增长的关系研究 [J]. *中国人口·资源与环境*, 24(9): 59–67. [Zhu D J, Zhang S. 2014. Research on ecological wellbeing performance and its relationship with economic growth [J]. *China Population, Resources and Environment*, 24(9): 59–67.]
- Akenji L. 2014. Consumer scapegoatism and limits to green consumerism [J]. *Journal of Cleaner Production*, 63: 13–23.
- Banbury C, Stinerock R, Subrahmanyam S. 2012. Sustainable consumption: Introspecting across multiple lived cultures [J]. *Journal of Business Research*, 65(4): 497–503.
- Chico D, Aldaya M M, Garrido A. 2013. A water footprint assessment of a pair of jeans: the influence of agricultural policies on the sustainability of consumer products [J]. *Journal of Cleaner Production*, 57: 238–248.

- Chisholm R A. 2010. Trade-offs between ecosystem services: water and carbon in a biodiversity hotspot [J]. *Ecological Economics*, 69(10): 1973–1987.
- Cogoy M. 2009. A model of eco-efficiency and recycling [J]. *Economics E-Journal*, 3. DOI: 10.5018/economics-ejournal.ja.2009-21.
- Cohen M J, Brown H S, Vergragt P. 2013. Innovations in sustainable consumption: new economics, socio-technical transitions and social practices [M]. Cheltenham: Edward Elgar Publishing: 209–228.
- Costanza R, Kubiszewski I, Giovannini E, et al. 2014. Development: time to leave GDP behind [J]. *Nature*, 505(7483): 283–285.
- Daly H E, Cobb J B. 1989. For the common good: redirecting the economy toward community, the environment and a sustainable future. Appendix: the index of sustainable economic welfare [M]. Boston: Beacon Press: 401–455, 482.
- Dawkins E, André K, Axelsson K, et al. 2019. Advancing sustainable consumption at the local government level: a literature review [J]. *Journal of Cleaner Production*, 231: 1450–1462.
- DGE. 2012. Website of the German nutrition society [Z/OL]. <http://www.dge.de/>.
- Ding Z R. 2012. The impact research of value orientation and pattern evolution of consumption on environmental issues [J]. *Energy Procedia*, 16: 508–515.
- Duchin F. 1983. The world model: an interregional input-output model of the world economy [J]. *Contributions to Economic Analysis*, 147: 167–182.
- Duchin F. 1994a. Indonesia: resources, ecology and environment [J]. *Ecological Economics*, 11(2): 164–165.
- Duchin F. 1994b. Reducing CO₂ emissions: a comparative input-output study for Germany and the UK [J]. *Ecological Economics*, 11(1): 85–86.
- Duchin F. 1995. In honor of Wassily Leontief's 90th birthday [J]. *Structural Change and Economic Dynamics*, 6(3): 267–269.
- Duchin F. 2005. Sustainable consumption of food: a framework for analyzing scenarios about changes in diets [J]. *Journal of Industrial Ecology*, 9(1/2): 99–114.
- Durning A T. 1994. The conundrum of consumption [M]// Mazur L A. Beyond the numbers: a reader on population, consumption, and the environment. Washington, DC / Covelo, California: Island Press: 40–47.
- Ehrlich P R, Holdren J P. 1971. Impact of population growth [J]. *Science*, 171(3977): 1212–1217.
- Feldman F. 2010. What is this thing called happiness? [M]. Oxford: Oxford University Press: 107–136.
- Fischer D, Böhme T, Geiger S M. 2017. Measuring young consumers' sustainable consumption behavior: development and validation of the YCSCB scale [J]. *Young Consumers*, 18(3): 312–326.
- Friel S, Barosh L J, Lawrence M. 2014. Towards healthy and sustainable food consumption: an Australian case study [J]. *Public Health Nutrition*, 17(5): 1156–1166.
- Geiger S M, Fischer D, Schrader U. 2018. Measuring what matters in sustainable consumption: an integrative framework for the selection of relevant behaviors [J]. *Sustainable Development*, 26(1): 18–33.
- Geng D Y, Liu J J, Zhu Q H. 2017. Motivating sustainable consumption among Chinese adolescents: an empirical examination [J]. *Journal of Cleaner Production*, 141: 315–322.
- Govindana K, Jiménez-Parra B, Rubioc S, et al. 2019. Remanufacturing: opportunities and challenges for a sustainable consumption [J]. *Resources, Conservation & Recycling*, 151. DOI: 10.1016/j.resconrec.2019.104420.
- Grabs J. 2015. The rebound effects of switching to vegetarianism. A microeconomic analysis of Swedish consumption behavior [J]. *Ecological Economics*, 116: 270–279.
- Henderson H, Lickerman J, Flynn P. 2000. Calvert-Henderson quality of life indicators [M]. America, Maryland: Calvert Group, Ltd.: 1–361.
- Hoekstra A Y, Chapagain A K, Aldaya M M, et al. 2011. The water footprint assessment manual: setting the global standard [M]. London: Earthscan.
- Hoekstra A Y, Chapagain A K. 2007. Water footprints of nations: water use by people as a function of their consumption pattern [J]. *Water Resources Management*, 21(1): 35–48.
- Hoekstra A Y, Mekonnen M M. 2012. The water footprint of humanity [J]. *PNAS*, 109(9): 3232–3237.
- Jackson T, Marks N. 1999. Consumption, sustainable welfare and human needs—with reference to UK expenditure patterns between 1954 and 1994 [J]. *Ecological*

- Economics*, 28(3): 421–441.
- Jigmi Y. 2005. What does Gross National Happiness (GNH) mean? [C]// The 2nd International Conference on Gross National Happiness, Rethinking Development, Local Pathways to Global Wellbeing. St. Francis Xavier University, 20—24 June, Halifax, Canada.
- Khalili N R, Melaragno W, Haddadian G. 2011. Promoting sustainable consumption [M]// Practical Sustainability. New York: Palgrave Macmillan US: 207–224.
- Leontief W. 1970. Environmental repercussions and the economic structure: an input-output approach [J]. *The Review of Economics and Statistics*, 52(3): 262–271.
- MA (Millennium Ecosystem Assessment). 2005. Ecosystems and human well-being [M]. Washington, DC: Island Press.
- Max-Neef M. 1992. Development and human needs [M]// Ekins P, Max-Neef M. Real-life economics: understanding wealth creation. New York: Routledge: 197–214.
- McCollough J. 2012. Determinants of a throwaway society—a sustainable consumption issue [J]. *The Journal of Socio-Economics*, 41(1): 110–117.
- McDonald S, Oates C J, Alevizou P J, et al. 2012. Individual strategies for sustainable consumption [J]. *Journal of Marketing Management*, 28(3/4): 445–468.
- Nazzari D, Batarseh O, Patzner J, et al. 2013. Product servicing for lifespan extension and sustainable consumption: an optimization approach [J]. *International Journal of Production Economics*, 142(1): 105–114.
- Noorman K J, Biesiot W, Moll H C. 1999. Changing lifestyles in transition routes towards sustainable household consumption patterns [J]. *International Journal of Sustainable Development*, 2(2): 231–244.
- Panzone L A, Wossink A, Southerton D. 2013. The design of an environmental index of sustainable food consumption: a pilot study using supermarket data [J]. *Ecological Economics*, 94: 44–55.
- Peattie K. 2010. Green consumption: behavior and norms [J]. *Annual Review of Environment and Resources*, 35(1): 195–228.
- Russell D C. 2012. Happiness for humans [M]. Oxford: Oxford University Press.
- Saaty T L. 1980. The analytic hierarchy process [M]. New York: McGraw-Hill: 23.
- Schroeder P, Anantharaman M. 2017. “Lifestyle leapfrogging” in emerging economies: enabling systemic shifts to sustainable consumption [J]. *Journal of Consumer Policy*, 40(1): 3–23.
- Shang H Y. 2015. Sustainable household food consumption patterns in Zhangye City of Heihe River [J]. *Advance Journal of Food Science and Technology*, 7(2): 113–119.
- Smith L M, Case J L, Smith H M, et al. 2013. Relating ecosystem services to domains of human well-being: foundation for a U.S. index [J]. *Ecological Indicators*, 28: 79–90.
- Tseng M L, Tan K H, Geng Y, et al. 2016. Sustainable consumption and production in emerging markets [J]. *International Journal of Production Economics*, 181: 257–261.
- UN. 2015. World population prospects: the 2015 revision [R].
- UNEP. 1994. Elements for policies for sustainable consumption [R].
- Vanham D. 2013. The water footprint of Austria for different diets [J]. *Water Science and Technology*, 67(4): 824–830.
- Vergragt P, Akenji L, Dewick P. 2014. Sustainable production, consumption, and livelihoods: global and regional research perspectives [J]. *Journal of Cleaner Production*, 63: 1–12.
- Xu S G, Chu C L, Zhang Y N, et al. 2018. Entangled stakeholder roles and perceptions of sustainable consumption: an evaluation of sustainable consumption practices in Tianjin, China [J]. *Journal of Environmental Management*, 223: 841–848.