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Evaluating 'green jobs': a framework for understanding relationships between employment and biodiversity

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Policy efforts to halt and reverse biodiversity loss often view expanding green jobs as a win-win scenario with economic and environmental benefits. However, there is no universally-accepted definition of the term 'green job', and relationships between employment and biodiversity can be complex and multifaceted. This study presents a new analytical tool to help visualise these dynamics and better understand the role of different jobs in transitioning to a sustainable economy.

This study adopts a social-ecological approach – which views social and ecological systems as fundamentally inter-dependent and co-existent. The researchers consider the complex dynamics within employment-biodiversity relationships, including how different effects impact on each other to influence outcomes. It is important to distinguish between jobs that play a significant role in a stable sustainable economy and employment that, while facilitating the transition to a sustainable economy, plays little part within it, say the researchers.

'Green jobs' are often defined in terms of the UN Sustainable Development Goals and can include activities such as providing environment-enhancing services, reducing environmental damage and the direct protection of biodiversity. Bodies such as the International Labor Organisation[1] have identified the creation of green jobs as a co-benefit of the 2015 Paris Agreement. In 2017 there were an estimated 465 450 jobs in the environmental sector in France, over 5% more than the previous year[2]. Whilst work in this area has so far focused on quantitative aspects of this employment sector, this study aims to clarify the definition and classification of green jobs, say the researchers.

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In order to visualise the key elements of employment-biodiversity dynamics, the researchers develop and apply a three-dimensional framework to highlight specific relationships between employment growth and biodiversity benefits. The three factors they consider are:

1. the direct impact of employment growth on biodiversity;
2. the impact of biodiversity enhancement on employment growth;
3. the indirect impact of employment growth on biodiversity (through effects it may have on other damaging or restorative activities that precede or follow it).

All variables are given values from -1 to +1, to represent stronger or weaker effects in a negative or positive direction. The researchers assign these values based on a qualitative assessment of different effects, informed by expert advisors.

The researchers identify four main categories based on the direct impact of the job on biodiversity and the impact of biodiversity on the job. These categories are further divided into eight types of employment depending on whether the indirect impacts are positive or negative. In the first main category, where direct impacts on biodiversity and impacts of biodiversity are both positive, the jobs are 'self-reinforcing': they directly enhance biodiversity and are in turn enhanced by increased biodiversity (such as monitoring sustainable harvesting levels). Secondly, where these two influences are both negative this creates a vicious cycle for biodiversity, with increasing employment damaging biodiversity, and depleted biodiversity stimulating employment. The researchers cite artificial pesticide use – leading to reductions in pest predators and hence greater need for pesticides – as such an activity.

In the third and fourth categories, the effects are contradictory. In the third, the researchers describe jobs which enhance biodiversity but are in less demand as biodiversity improves as mitigation-type activities – a category which includes many typical green jobs such as habitat restoration. The fourth category includes jobs which damage biodiversity but are stimulated by its enhancement – including wild harvesting activities such as fishing. The researchers argue that while such activities are theoretically self-regulating, with activity levels declining as biodiversity decreases, overexploitation is a risk (as with some fisheries).

The researchers examine three case study 'green jobs' – and produce five results. In the first case study, they find that the re-vegetation of high-altitude meadows in France has positive direct impacts on biodiversity but is negatively affected by enhanced biodiversity (as it is conducted on damaged areas). Where it uses locally-sourced seeds they find it has positive indirect effects on

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biodiversity and hence is a true 'mitigation activity'. However, where it uses non-local seeds they find that the overall indirect effects are negative and, therefore, describe this as a 'mitigation-perverse' activity – it appears to be mitigating but may have an overall negative impact.

In the second French case study, the researchers consider that guided nature tourism, such as wildlife watching, hiking and safaris, has a small negative direct impact on biodiversity, but is itself enhanced by improved biodiversity and has a positive indirect impact, making this a 'biodiversity-harvesting' job.

In the third case study, they find that bioengineering of soil to secure riverbanks (using vegetation rather than construction materials to stabilise the bank) is negatively affected by enhanced biodiversity (as it is conducted on damaged areas) but has positive indirect effects on biodiversity. Where this technique is applied to previously damaged banks it also has a positive direct impact on biodiversity, making it a mitigation activity. However, when it is applied to banks that previously held natural vegetation (as part of a wider land development project) the direct biodiversity impact is strongly negative as this replaces an established riverbank ecosystem.

The researchers present the framework as an initial attempt to map biodiversity-employment relationships. They claim that such approaches could be useful in policy development to anticipate the evolving social-ecological profiles of particular jobs and to highlight where incentives may have unintended and even perverse effects. They suggest that offsetting measures which create new jobs (such as within land-development projects) can be detrimental, as this can legitimise biodiversity-destructive activities. They also suggest that green job policies might review their environmental impacts through outcome monitoring, and they present brief recommendations to encourage this.

In addition, the researchers posit that the new framework could also be adapted to other sustainable development goals such as climate change and clean energy.

1. International Labour Organization (2018) *World Employment and Social Outlook 2018: Greening with Jobs*.

2. Nauroy, F., (2019) *Les éco-activités et l'emploi environnemental en 2017: premiers résultats*. Commissariat Général au Développement Durable, Paris.