Energy Poverty Eradication and Climate Resilient Livelihoods through Win-Win Solutions (WWS)

↘ Co-designed solutions in renewable energies and resilient livelihoods provide win-win benefits for local communities and the climate

Co-designed strategies in renewable energies and place-adapted infrastructures deliver economic and social benefits at community level and contribute to long-term climate adaptation and mitigation.

↘ Focus on empowering agents to work with 'glocal' networks to implement and upscale diverse win-win solutions

Instead of aiming to up-scale a single standardised solution to fit all kinds of contexts, what is required is to up-scale multiple capacities of local agents to cooperate with transnational networks and to develop, co-design and implement a suit of diverse, inclusive and often unique solutions.

↘ Do not expect perfect solutions

Win-win solutions for energy poverty eradication and resilient livelihoods constitute 'imperfect' solutions, in need of constant improvement and flexible standards suited to local conditions and needs. Mutual learning and experimentation across solution-networks and scales is crucial.

↘ Towards a Restorative Economy vision for present and future generations

Win-win solutions need to move beyond just 'doing less harm' to restoring the basic social-ecological capitals of sustainable development. Solutions that support a Restorative Economy appear to be the most robust and innovative strategies able to tackle the multiple sources and dimensions of poverty and vulnerability.

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Development Alternatives

GREEN WIN

Resilient livelihoods as a climate win-win opportunity landscape

Renewable energies is one of the fastest growing markets in the world . But in order to achieve the Paris Agreement special focus must be given to win-win innovations carried out by micro, small and medium enterprises, as well as in agro-forestry ecosystems, land use strategies and at community, rural and household levels

Climate change does not only pose increasing risks to local livelihoods and economies, but also provides a large array of opportunities for social innovation and international collaboration. Any attempt of limiting global warming below 2°C - 1.5° C will (as per the UNFCCC Cop 21 Paris Accord) require pathways that include not only the vast removal of carbon dioxide (e.g., with large strategies of reforestation and afforestation, promoting ecosystems restoration and turning into conservation and smart agriculture practices) but above all, new forms of green businesses and of economic collaboration. This is especially the case in rural and poor areas of the world where there is a major potential for societal-climatic positive transformations.

Despite some identified barriers, many supporting measures can already be implemented fast to accelerate the deployment of win-win solutions in rural and poor contexts of the world. For instance, the removal of perverse incentives, helping to connect green-tech networks can open climate-resilient pathways and improve the competitiveness of businesses which contribute to a deeply decarbonised economy.

In the absence of strong global governance institutions, and of clear long-term policy and economic signals able to tackling with the climate challenge, the role of non-state, private actors and 'glocal' networks (transnational networks operating at various scale levels to meet specific needs) is crucial in delivering the required transformations at a very community and regional level. In the case of eradicating energy poverty and building climate resilient livelihood many trade-offs between mitigation and adaptation can be overcome and the overall costs of climate action can be reduced by aligning decarbonisation policies and incentives to broader sustainable development goals.

Overcoming climate trade-offs with sustainable development goals

Trade-offs between climate adaptation and climate mitigation can be overcome at local level by focusing on practical actions which contribute to achievement of Sustainable Development Goals (SDGs). This is particularly the case with strategies that promote renewable energy use, guarantee environmetal sanitation, improve resource efficiency and ensure fair local governance arrangements. These strategies have the potential to foster livelihood resilience and transformative capacities at local level while reducing the costs of climate mitigation and adaptation.

Key lessons learned

Poverty and inequality, in their multiple forms, are interlinked components of the same problem which can be exacerbated by rapid climate change. They require synergetic solutions capable of address both aspects and their multiple common sources concurrently

1. Co-designed solutions in renewable energies and resilient livelihoods provide win-win benefits for local communities and the climate.

Empirical research on community livelihoods dynamics enables a better understanding of the roles played by different kinds of local economies, novel business models, as well as of non-monetised actors and institutional diversity in coping with growing challenges of climate change. Such empirical knowledge, if co-produced with local actors, also facilitates the implementation of robust climate strategies. These strategies can deliver both short-term and long-term economic and social benefits aligned with sustainable development goals to local communities. In particular, win-win solutions and green business models that respond to specific needs happen whenever they produce multiple benefits simultaneously in terms of health, shelter, basic services, and social cohesion and community support. Understanding and embracing the large complexity of such micro social-economic dynamics is of paramount importance in characterising and assessing win-win solutions for climate and sustainable development action.

2. Focus on empowering agents to work with 'glocal' networks to implement and upscale diverse win-win solutions

Empowering women, local community groups and other beneficiaries of resilience services to create a joint understanding of climate and development challenges, as well as the design of the processes of engagement, is crucial in the success of implementation of win-win solutions. In the GREEN-WIN cases of India, Indonesia and South Africa this has been achieved by empowering marginalised groups, such as displaced people, racial minorities and poor populations, in the shaping and creation of fit-for-purpose solutions. Such groups have been involved in the building the necessary conducive conditions to address renewable energy provision, the implementation of local sanitation infrastructures and to ensure livelihood knowledge for individual and community thriving. Bottom-up, grass-root solutions and projects generate lessons and approaches which then can be taken up in other contexts without the need for a massive, centralised, rollout. These projects happen because of access to supportive ('glocal') international & local) networks that enable emerging green businesses to learn and adapt their organisation models, products and services more efficiently. Knowledge transfer occurs through interactions between global organisations such as donors, corporate foundations, social enterprises, NGOs and local actors who operate at a community level.

3. Do not expect perfect solutions

Win-win solutions for energy poverty eradication and resilient livelihoods constitute 'imperfect' solutions which do not follow rigid standards often associated with mass production and also in need of constant improvement. This incremental and open approach is often driven by the urgent need for their implementation, with a large degree of improvisation, provided the large

resource and capacity constraints. However, such dynamic solutions often respond to real needs, which emerge in complex environments such as informal, peri-urban, deprived or poor or rural settlements where standardised or high-tech approaches are too rigid, not fit for local purposes, or too expensive to work. However, while serving critical needs, they can be improved over time as new resources or capacities become available. Such imperfect solutions do not require long-term, centralised strategic plans either. They are often developed step-by-step in a trial-and-error, or even haphazard way. Hence, these cases require the provision the right conditions for mutual learning and knowledge sharing among successful strategies, agents and communities in order to encourage the creation of new transformative capacities and projects. Newly acquired knowledge can, in turn, be adapted to local needs and projects in a synergetic mode.

Some GREEN-WIN examples of win-win solutions in rural and poor context from India, Indonesia and South Africa

These are some of best practices on the win-win solutions and strategies analysed in GREEN-WIN:

- In Indonesia, a research-based company (Su.re.co) creates a market for green products and helps improve local community livelihoods by supporting the development of smart agriculture and integrated renewable energy production (biogas). Su-re.co's small-scale climate-smart agricultural practices which generate additional income and job opportunities, improve farmers' wellbeing and facilitates access to clean energy for local community and coffee farmers.

- In South Africa, new social-purpose start-ups are leveraging fin-tech innovation to connect people to local sustainable investment opportunities with limited mediation. Because of decreased transaction costs, new forms of investment can benefit poor communities directly by financing solutions that fall through the cracks for conventional finance opportunities. In particular, the social enterprise, 'The Sun Exchange', uses the Blockchain to allow individuals around the world to invest fiat or crypto-currency in small-scale solar energy. In this case, the Blockchain functions as a public, transparent, distributed ledger for all project transactions and information.

- In South Africa, incremental solutions inspired by biomimicry principles can improve welfare in informal settlements. A primary example, the Genius of Space project uses participatory processes to develop nature-inspired local infrastructure to manage greywater and solid waste. These kinds of solutions are flexible enough to adapt to and meet real local needs as defined by beneficiaries.

↘ In South Africa, distributed solutions, including renewable energy microgrids like Zonke Energy in Cape Town provide clean, affordable, energy for rural villages and informal urban settlements. These solutions work where traditional bulk electrical infrastructure is not available, practical or financially feasible.

↘ In India, the work of TARA-Development Alternatives showed that Public-Private-People collaborations grow local capacities and create the conditions for greater economic inclusion. TARA-DA works with local communities and local entrepreneurs to explore solutions that adhere the triple bottom line principles of "people-planet-profit". TARA-DA have particularly showed impact on decentralised renewable energy solutions and green building materials for construction. In case of Decentralised renewable energy solutions, a model has been developed and implemented that just does not provide access to energy to the local communities but also expands entrepreneurial capacities of the region by promoting energy based local enterprises. In the case of green building materials, an enterprise model that reduces the waste stream, low cost alternate to the building materials has successfully been developed. In both cases mentioned above, the impact can be seen in enhancing climate and resilience of the community.

↘ In Munger, India, cooperation between local government, NGOs, and CSR programmes enables micro-economic opportunity by not wasting waste. There is a tremendous potential for the recycling and reuse of waste and the development of 'waste-to-energy' and 'waste-to-food', 'waste to income' business models.

↘ In India, Biogas installations at Bheldi, in the State of Bihar, use cow manure from local dairies and Su-re.co in Indonesia uses waste from local coffee farming in coffee processing. These distributed solutions and green businesses can develop independently or relate to each other through franchising models like TARAurja Solar Picogrid in Katsa, India.

Solar panels in Bihar, India

Social inclusion and respect for diversity: Two key conditions for climate resilient local economies

Financial innovation focused on responding to opportunities to meet local needs at all scales is required for an open, inclusive sustainable economy

WWS depend on the extent to which they also lead to the emergence of different kinds of context-specific conditions for an inclusive economy. The empowerment of formerly excluded actors (e.g. women, young people, migrant or other structurally disadvantaged groups) has been widely demonstrated to hold significant poverty reduction and other sustainable development related benefits. To be meaningful, this empowerment must allow these actors to participate in economic decisions affecting their own wellbeing, including the management of local resources and development of new business opportunities. Distributed innovations at local level combining green technologies, mobile ICT innovations, community participation and new forms of low-income finance and banking, play a significant role in fostering resilient livelihoods and eradicating energy poverty around the world. Among the various enabling conditions identified for the successful implementation of win-win strategies are:

↘ **Innovative financial schemes and incentives:** Microfinance and microcredit innovations, including collective bank accounts for poor people or new forms of community-based currencies or time-banking that allow the sharing both risks and benefits of new economic activities can contribute to community resilience. For instance, in the Bundelkhand region in India, collective bank accounts, originated from the Self-Help Groups in India, have been created to empower women to run community-based renewable energy projects. Also in South Africa, fin-tech innovation enabled by the Blockchain technology creates new opportunities for 'micro-investment' by private actors to make projects happen that are too small for donor funds and perceived as too risky by conventional banks. New modalities of micro-insurance schemes linked with the provision of climate change data and new climate services can be crucial in the currently fast changing biophysical conditions.

↘ **Conducive regulatory and governance environments:** Achieving good governance and regulatory conditions at local and regional level is fundamental for securing the emergence and implementation of sustainable win-win solutions able to address poverty and climate resilient livelihoods. Such goal comprise the ensuring fairness and democratisation of economic and market transactions both at local and global levels. Many new green technologies, such as renewable energy or water-related infrastructure, require enabling regulatory frameworks which both do not put at risk existing investments and to protect community interests. Regulations, specially at regional level, can create the certainty required for medium to long-term investments. New forms of collaboration between private, public and community actors –like those aimed at delivering community services or generating new gren business alliances- may also require enabling amendments to public administration and public procurement actors. At the same time, corruption and how local administrations deal with local vested interests also needs to be seriously taken into account. Transparency and accountability of

interventions and projects is of central importance to secure the continued engagement and investment of international actors or donors in the long term.

New forms of business models allow for more responsible forms of ownership, risk and profit sharing

↘ **New business models and the role of entrepreneurial and management skills for sustainability-oriented businesses:** Learning to identify and generate green business opportunities at community level required to secure livelihood income can be trained and promoted through carefully tailored community-based strategies. Ensuring the employability and engagement of young people in green businesses also requires special attention. In this sense, new forms of business models allow more responsible forms of ownership - risk and profit sharing should also an important part of the training and eventual practices of green businesses. Transforming external economic interactions towards sustainable development goals starts at organisation level by securing fair working conditions and new forms of profit-sharing schemes. Cooperatives and other new forms of citizen-based business models are particularly open to embrace such alternative modes of organisation. While allowing innovative and more responsible ways of ownership, risk an profit sharing they can develop their green-tech and low-carbon products and services. In particular, there is a huge potential in the revalorisation and reuse of waste and the development of 'waste-to-energy' and 'waste-to-food', 'waste to income' business models to support energy poverty alleviation and resilient livelihoods. Larger investments in waste to energy or recycling facilities can enable responsible strategies and micro-scale economic opportunities in waste picking, sorting and processing ('don't waste the waste!')

There is a need to emphasise the need to explore, enable and strengthen experimentations and deriving scientific solutions at the local level

↘ **Support of education, behavioural change and cultural innovation:** Most people think of culture as a given and a difficult-to-change societal component. However culture and traditions can also be purposely modified to achieve a better-off collective situation by combining education, incentive regulations and social learning. Such cultural changes are especially urgent when addressing unjust situations and the oppression of groups or women which can become the central drives of social and community transformation. For instance, green technologies such as those facilitated by Zonke Energy in South Africa, or household biogas installations in India, were often unfavourably compared with more conventional or traditional options by consumers (including traditional wood-based ones). In order to promote these technologies, local governments, entrepreneurs and others raised awareness and communicate their effectiveness by creating local pilots co-managed by local actors. Also in India, the solar energy projects implemented in poor communities supported by Development Alternatives in Madhya Pradesh were run by a council of empowered women. Concrete demonstration of practical examples can hence be more effective than communication campaigns. Where possible, relevant local governments should communicate in a clear and consistent way to support green-win innovations. As the size of projects like this scale up, community engagement may need to be deepened because it is more challenging to assess levels of acceptance and access reliable feedback in larger populations.

↘ **Consider fast changing market and technological conditions:** For green businesses to be successful without relying on public support they need to be financially and economically competitive in the market, regardless of whether they are green or not ('people will buy the product, not necessarily the cause'). Hence, a crucial task is to create and secure sustainable demand for green products by developing appropriate and competitive green innovations and services. Although win-win solutions that take the form of products and services that help to eradicate poverty and support resilient livelihoods are often not standardised and do not use the same quality certification standards than in other international markets, they need to be able to compete with non-green products and services too. It may be useful to either align or adapt international standards where financially feasible and for local actors to develop new locally appropriate standards for sustainability.

Scale up the transformative network, not the 'solution'.

Aiming at scaling the provision of products and services that worked in one place in order to transfer them to another is not always the answer. The GREEN-WIN cases of India, Indonesia and South Africa show that distributed, community-based projects, as well as small and micro-enterprises, can provide effective solutions that address energy poverty and foster resilient livelihoods at the local level. However, solutions in the form of a single technical design intended to fit all kinds of communities and purposes may not be scalable, or may not need scaling. Instead, win-win solutions come in multiple forms and respond to many different kinds of needs. Hence, they are generated in diverse ways and co-evolve with local contexts and agents. What needs to 'scale up' are the transformative capacities to co-design, multiply and develop multiple solutions suitable for multiple environments. Or in other words, we must ensure that people have the opportunity and the power to be the solution.

Towards a Restorative Economy vision for present and future generations.

A transformative vision is required to trigger collective action, steer institutional change and build the necessary capacities for the implementation of innovative solutions able to deal with global and local socio-climate challenges. This is especially the case in developing economies where is both an urgent need and huge potential for the engagement of large sections of the population and in creating 'glocal' networks for ecosystems restoration. Moving towards Restorative Economy would entail going beyond just 'doing less harm' (e.g. less relative energy consumption or GHG intensity per $) in order to restore local watersheds, agricultural soils or mangroves upon which most of the rural and poor livelihoods and incomes of the world depend on. Further research therefore is needed to explore the financing opportunities and enabling conditions to implement such restorative economy solutions. The GREEN-WIN examples have showed that it is possible to attain positive tipping points in local climate and livelihood resilience at local level whenever such intervention have yielded multiple benefits, and contributing to re-establish local social-ecological capitals, empower new networks and foster business opportunities that addressed both climate and sustainable development goals at the same time.

Solutions that secure a Restorative Economy may emerge as the most robust and innovative strategies able to tackle the multiple sources and dimensions of poverty and vulnerability in many parts of the world. Restorative economic solutions can build capacities for local climate resilient livelihoods and generate the necessary economic incentives and benefits in the short term for ensuring sustainability-oriented action while engaging a wide range of local agents also in the long term.

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Green growth and win-win strategies for sustainable climate action (GREEN-WIN)

The GREEN-WIN Project identifies, develops and critically assesses win-win strategies, green business models and green growth pathways that bring short-term economic benefits, while also supporting mitigation and adaptation goals within the broader sustainable development agenda.

Work programme

↘ At national levels, GREEN-WIN analyses win-win opportunities that arise through integrating policies across different sectors, and advances state-of-the-art macro-economic models in order to identify green growth pathways.

↘ At local levels, GREEN-WIN carries out action research case studies to develop green business models and enabling environments in the following three areas: i) coastal flood risk management in Jakarta, Kiel, Rotterdam and Shanghai; ii) transformations in urban systems in Barcelona, Istanbul, Shanghai and Venice; and iii) energy poverty and climate-resilient livelihoods with case studies in India, Indonesia and South Africa.

↘ Cutting across both levels, GREEN-WIN investigates financial products and policies, as well as financial system reforms that redirect financial flows towards sustainability and climate action.

↘ All of these activities are embedded in an open dialogue between research institutes, international organisations, business, and civil society that co-develops shared narratives around win-win strategies, business opportunities and green growth pathways

Project partners

Global Climate Forum (GCF), Germany (coordinator) | The Institute of Environmental Sciences and Technology, Autonomous University of Barcelona, Spain | E3-Modelling, Greece | Environmental Change Institute, Oxford University, UK | Ecole d'Economie de Paris, France | University College London, UK | The Ground_Up Association, Switzerland | Stichting Deltares, The Netherlands | Institute for Advanced Sustainability Studies, Germany | Global Green Growth Institute, Republic of Korea | Jill Jaeger, Austria | European Centre for Living Technology at Università Ca' Foscari Venezia, Italy | Institute of Environmental Sciences at Boğaziçi University, Turkey | Universitas Udayana, Udayana University, Indonesia | University of Cape Town, South Africa | 2° investing initiative, France | Sustainability and Resilience, Indonesia

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