International Rivers' Contribution for the Rio+20 Compilation Document
October 2011

The UN Conference on Sustainable Development 2012 offers an opportunity for world leaders to confront the challenges of natural resource depletion, poverty and climate change in an integrated way. With bold thinking and concrete commitments, Rio+20 could help transform the global economy to one that promotes equity, sustainability and security. It could facilitate a shift in investment away from destructive, outdated technologies towards innovative, pro-poor, sustainable solutions to meet the world's food, water and energy needs. International Rivers welcomes the opportunity to provide input into this critical process and offers the following comment and recommendations on the conference's Green Economy theme.

Executive Summary

Poor and marginalized communities are especially dependent on natural resources for their livelihoods. Therefore, sustainably managing, conserving and valuing these natural assets while meeting the world's food, water and energy needs is essential to reducing poverty. The impacts of climate change, particularly on water, will make sustainable-development challenges more acute. Water, energy and food security in a warming world will require major improvements in water-use efficiency, sustainable agricultural intensification, and in decentralized techniques that are flexible and adaptable. Small-scale, bottom-up water and energy projects offer win-win solutions in terms of efficient and low-impact water supply, strengthened food security, improved access to energy, and enhanced resilience to climate change. They include local check dams, other water harvesting techniques, mechanic treadle pumps, drip irrigation, the system of rice intensification, as well as wind, small hydro, solar and geothermal energy technologies. These projects empower poor people, enhance their livelihood security, promote climate resilience and have an impressive track record. If adapted to local circumstances and backed with the necessary legal, scientific and financial support, bottom-up approaches can be scaled-up significantly. Future development strategies need to move away from energy and water projects that depend on stable climatic conditions and subsidies for environmentally and socially harmful technologies must urgently be phased out. Avoiding the errors of the past will require the application of participatory planning and decision-making processes as well as strict, mandatory social and environmental standards. The guidelines that have been recommended by the World Commission on Dams (WCD) are the most appropriate framework for decision making on water and energy projects.[1]

[1] See World Commission on Dams (2000), pp. 195ff.

2150 Allston Way, Suite 300, Berkeley, CA 94704-1378, USA | Tel: + 1 510 848 1155 | Fax: + 1 510 848 1008
info@internationalrivers.org | www.internationalrivers.org

Green Economy: Food, Water and Energy Security in a Changing Climate

Sustainable strategies for meeting food, water and energy needs while conserving natural capital must be central to a green economy that seeks to eradicate poverty. **Poor and marginalized communities are especially dependent on natural resources** for their livelihoods. Therefore, **sustainably managing, conserving and valuing these resources and the services they provide is a necessary pre-condition for achieving global targets to reduce poverty**. Without a reversal of current trends that favor natural capital depletion by, in part, failing to value ecosystem services and subsidizing unsustainable activities, poverty eradication will remain an elusive goal.

The threat posed by **climate change exacerbates the challenges of addressing food, water and energy needs of a growing population**. Some of the worst impacts of climate change on both people and ecosystems will be felt through its impacts on water. Rivers, the lifelines of our planet, are already experiencing a higher rate of species extinction than any other major ecosystem. Climate change will compound the problems caused by large dams and other water infrastructure for species as well as for people who depend on rivers for their livelihood. Additionally, more extreme floods will threaten the safety of existing infrastructure, and unprecedented droughts will reduce the hydropower and water supply services that dams are built to provide. A new paper in the scientific journal, PLoS Biology, found that "particularly for large [water] infrastructure projects, the risks for investors, communities, and ecosystems are extremely high given uncertainties in future hydrological conditions". It concluded that "climate-infrastructure mismatches may make poor nations even poorer".[2] **Water security in a warming world will require major improvements in water-use efficiency and in decentralized techniques** such as rainwater harvesting and improved groundwater management. These low-impact solutions allow more flexible responses to changing rainfall and streamflow patterns than large centralized infrastructure projects.

It will be **essential to intensify agriculture and improve water security** to meet the water, energy and food security challenges of the future. Yet **intensification should not be equated with an increase in chemical inputs and traditional irrigation techniques, just as water security should not be equated with big dams and centralized reservoirs**. Organic and sustainable agriculture practices should be expanded as much as possible. Decentralized, small-scale water and energy projects offer win-win solutions in terms of efficient and low-impact water supply, strengthening food security, improving access to energy, and strengthening resilience to climate change. These projects empower poor people and enhance their livelihood security.

Fortunately, **solutions that integrate water, food and energy security with climate resilience exist**. **They include a wide spectrum of small, decentralized, bottom-up approaches** such as local check dams, other water harvesting techniques, mechanic treadle pumps, drip irrigation, and the system of rice intensification (SRI). Combining traditional knowledge and innovative techniques, these approaches rely on farmers' initiatives, use water efficiently, cost less than

[2] Matthews JH, Wickel BA, Freeman S (2011) Converging Currents in Climate-Relevant Conservation: Water, Infrastructure, and Institutions. PLoS Biol 9(9): e1001159. doi:10.1371/journal.pbio.1001159.

large dams, enhance the food security of the poor, and typically help conserve our natural wealth. Similarly, a diverse mix of decentralized renewable energy projects – including wind, small hydro, solar and geothermal – can strengthen our resilience to climate change, improve energy access for the rural poor, and minimize negative environmental impacts.

Bottom-up solutions have an impressive track record. For example, SRI increases yields and makes the rice crop more resilient to climate change through reduced use of water, fertilizer and pesticides, but increased attention to soil biology. SRI methods have been validated in 42 countries in tropical, subtropical and moderate environments and across dry and humid climates.[3] SRI has typically shown marked increases in rice yields of 50-100%, water savings of usually 25-50%, cost savings of 10-20%, strengthened resistance to pests and diseases, and improved resilience to the stresses of extreme weather events linked with climate change.[4] The methods of SRI have also been extended to the growing of wheat, sugar cane and several other crops. Making use of labor, the one factor that poor farmers typically control, they have strengthened food security and resilience to climate change while simultaneously reducing the need for water inputs.

Water supply initiatives, such as the small check dams that the Tarum Bharat Sangh (TBS) has pioneered, have revived several rivers and brought prosperity to arid regions throughout Western India. In Rajasthan, supplying water from the check dams promoted by TBS costs $2 per person, whereas water supply from the massive Sardar Sarovar multipurpose dam costs approximately $200 per person. The simple treadle pumps that International Development Enterprises (IDE) developed have also cost-effectively lifted millions of farmers out of poverty. Irrigating a hectare of land from the Sardar Sarovar Project costs $3,800 but only $120 using the treadle pumps promoted by IDE.[5] UNDP's 2006 Human Development Report on water security strongly supports such a soft, decentralized approach to water infrastructure and food security. It estimates that with an initial investment of $7 billion, extending Gujarat's check dams all across India's rainfed farming areas could raise the value of the country's monsoon crop from $36 billion to $180 billion a year.[6]

Enabling Conditions

Building decentralized, small-scale water infrastructure not only improves the access of the poor to water, but also makes the water sector more resilient to the impacts of climate change. Yet these approaches have so far only received a minuscule proportion of the aid, investment and political support that large water and energy projects receive. **If adapted to local circumstances and backed with the necessary legal, scientific and financial support, bottom-up approaches can be scaled-up significantly**. Local communities and small farmers deserve legal rights to the land and water that they have worked with for generations. Small

[3]See Uphoff Norman (2011), The System of Rice Intensification: An Alternate Civil Society Innovation, in: Technikfolgenabschätzung – Theorie und Praxis, July 2011, pp. 45-52, p. 47.
[4] Ibid.
[5] See International Rivers Network (2006), Spreading the Water Wealth: Making Water Infrastructure Work for the Poor, pp. 2ff.
[6] UNDP (2006), Human Development Report 2006,Beyond Scarcity: Power, Poverty and the Global Water Crisis, p. 196.

farms and rainfed agriculture require research support on the same scale that was poured into the green revolution. Decentralized renewable energy options deserve priority over fossil fuels and large dams if development aid is to reduce energy poverty in a sustainable manner. Projects that address the nexus of water, energy and food security should be focused at the local level.

Future development strategies need to move away from harmful technologies that depend on stable climatic conditions. A recent World Bank report warns that "long-lifespan infrastructure, such as hydropower plants, is generally less adaptable" to climate change.[7] In addition to their often significant environmental and social impacts, large, centralized water and energy projects tend to prioritize the needs of urban centers, industry, and export markets. In comparison, small, decentralized and diversified renewable energy projects are more effective at providing access to electricity to the poor, safeguarding the environment, and strengthening resilience to climate change.[8] In many cases, renewable energy projects are not more expensive than large, conventional energy technologies, with the added benefit of not externalizing social and environmental costs. Subsidies for environmentally and socially harmful technologies must be phased out.

While decentralized, cost-effective approaches to water and energy supply and food security have huge potential, building large dams and other centralized water and energy projects may still be appropriate under certain conditions. **Avoiding the errors of the past will require the application of participatory planning and decision-making processes as well as strict, mandatory social and environmental standards**. The guidelines that have been recommended by the World Commission on Dams (WCD) are the most appropriate framework for decision making on water and energy projects.[9] This will include thoroughly assessing all available options; recognizing affected and, in particular, indigenous peoples' land rights; sharing benefits; and addressing the unresolved problems of existing projects.

Recommendations

- Before any water and energy programs and projects are initiated, national governments and intergovernmental organizations should carry out comprehensive, balanced and participatory **assessments of all needs and options**. These assessments should integrate social, environmental and economic aspects with equal weight.

- Given the perverse incentives and vested interests favoring new projects over efficiency improvements and restoration of existing infrastructure, national governments, parliaments and intergovernmental organizations should make **low-impact solutions** such as mechanic treadle pumps, drip irrigation, decentralized rainwater harvesting and groundwater recharging, the use of underground storage, decentralized renewables, the restoration of existing infrastructure and the installation of hydropower components at

[7] World Bank ESMAP (2011), Climate Impacts on Energy Systems, Key Issues for Energy Sector Adaptation, Jane Ebinger and Walter Vergara, 2011, p. 58.
[8] For the risks of centralized hydropower projects in terms of climate resilience, see World Bank ESMAP (2011), Climate Impacts on Energy Systems, Key Issues for Energy Sector Adaptation, Jane Ebinger and Walter Vergara, 2011, pp. 48, 58, 93.
[9] See World Commission on Dams (2000), pp. 195ff.

existing irrigation facilities an explicit priority of their agriculture, water and energy sector policies to improve access and security.

- Strengthening water, energy and food security for the poorest population groups requires a **shift of financial resources, research and institutional support** from large, centralized projects to decentralized, small-scale projects that can be managed at the local level. National governments and parliamentarians should redirect resources from international financial institutions to civil society organizations and others that are able to effectively support local-level initiatives.

- Intergovernmental organizations, national governments and parliaments should explicitly acknowledge and guarantee the customary and formal **rights of local communities** to their land, water, forests and other resources in their infrastructure strategies. This includes the right of indigenous peoples to free, prior informed consent (FPIC) regarding projects on their lands.

- Public and private financial institutions should establish or strengthen **mandatory social and environmental standards** to guide project selection and implementation. These standards should include evaluations of the risk that climate change poses to a proposed project as well as the expected impact of the project on climate change.

- A global initiative for **universal energy access by 2030** should be carried out, with energy efficiency and decentralized renewable options – which are more effective at expanding energy access for the poor than centralized large dams – as top priorities.