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Circular Economy Strategies for Sustainable Development in Niger

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1. Description of the Concept

The concept of the circular economy has gained momentum as a possible paradigm for sustainable development in light of the environmental and social constraints of traditional economic models. Classical linear economies are mainly built upon a "take–make–dispose" model, in which products use renewable or non-renewable resources provided by the environment and returned as waste after being consumed (O'Brien and Godden, 2015). This has resulted in over-exploitation of resources, environmental deterioration and increasing ecological stress, especially in resource-limited and vulnerable economies.

A circular economy, on the other hand, envisions a systemic transition in the management of resources — from (cradle-to-grave) to (womb-to-womb). Instead of considering waste as an inescapable product of economic growth, the circular economy is premised upon designing waste out of the cycle, retaining value within products, materials and resources for as much time as feasible. It is, among others, by means of reuse, repair, refurbishment, remanufacturing and recycling that aim at longer product lifespans as well as lower reliance on the extraction of virgin resources (Testa et al., 2015).

At the heart of it, a circular economy is based on decoupling economic growth from environmental degradation. Focusing on circular systems, efficient and regenerative patterns of material flow creating positive environmental impact without diminishing the overall financial value are sought. At stake: a total break with growth models which posit that continual increases in the use of resources is necessary for development.

The circular economy is constructed around various key principles. First, the product system design for durability, adaptation and longevity. That entails designing with quality, modularity and reparability in mind so that products can have long lives. Secondly, circular models "optimise material use and prevent waste generation at the source by enhancing the maintenance of products and reducing excessive production and consumption in favour of quality service provision throughout production-sharing-distribution systems". Third, the products are disassembled to salvage and reuse materials at the end of their functional life but before they become waste, which effectively reduces new resource extraction (Elia et al., 2017).

Nature as a priority feature of the circular economy An important element of the circular economy

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is its focus on regenerative and natureinspired ways of doing business. Taking inspiration from nature, where waste from one process becomes the food for another, the circular economy creates systems that replenish natural capital rather than exhaust it. This restorative practice is especially pertinent in industries like agriculture, water and energy, where the sustainable cycling of resources is a critical factor for long-term resilience.

Additionally, applying circular economy principles can also help to improve resource security and climate resilience in Niger. Better waste and water management, with more sustainable land-use practices can ease environmental stress as well as improve livelihoods. Likewise, circular solutions in energy—like the use of renewables and bioenergy production from organic waste—can contribute to a lesser dependence on fuel imports and inefficient traditional biomass resources.

But technical solutions alone are not enough for successful circular economy implementation. It is contingent upon accommodating policy environment, institutional capability, stakeholder's partnership and public awareness.

Governments can create enabling environments through policies, incentives and long-term planning, while the private sector and local communities generate innovation and deliver solutions on the ground.

In sum, the circular economy offers a broad template for reconfiguring development paths in resource-scarce settings. There is a possibility for promoting sustainable development in Niger by aligning economic activity with environment constraints and social demands with the goal to increase resilience, inclusiveness and long-term resource productivity (Andersen, 2007).

For poor countries such as Niger, the applicability of the circular model goes beyond ecology. Circulating approaches provide implementable answers to problems of resource shortage, a lack of industrial capacity and economic frailty. Through local re-use, repair and recycling efforts, circular economy approaches can create jobs, benefit the informal sector and small production units and bolster regional value chains. These features render the circular economy a resource-efficient concept appealing in low-income settings where high-technology options might be unaffordable or unavailable.

Furthermore, embracing the circular economy can bring about solutions to paper urgently dealing with problems that are confronting Niger — water shortages and striving for conservation of resources. Sources can also be rendered climate resilient through, for example water recycling, better use of resources in industries etc., as well environmental sound waste management systems to cope with the impact of climate change in Niger. Ensure resources for its people.

And finally the idea of economy can make Niger innovate, do research and be a technological advance. Adopting this model of production might help break the country’s reliance on imported products, build self-sufficiency and a more diverse economy (Gusmerotti et al., 201U).

It is important to highlight, however, that in order to successfully apply the principles of circular

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economy in Niger there will be a need for political willing and appropriate policies, institutional capacity build-up and active participation from all key stakeholders including government, private sector organisations, non-governmental organisations (NGOs) as well as local communities.

Cooperation and partnership between these actors will help shape the transition of Niger towards a circular economy and in order to it can truly deliver for sustainable development. The concept of economy provides a basis for promoting sustainable development in Niger. Prioritising resource efficiency, waste reduction and regenerative practices could potentially transform Niger's landscape to mitigate its impact and bolster resilience to global challenges. Employment, the well-being of Niger's citizens and economic opportunities can be increased with the implementation of concepts for a circular economy while also ensuring that the use of natural resources meets the needs of present generations without compromising those of future generations (Andersen, 2007) resilience against global challenges. Implementing the circular economy initiatives in Niger could open up opportunities for job creation and improve well-being of people, but also maintaining natural resources to future generations (Andersen, 2007)

2. Key Principles of Circular Economy

The circular economy is often put into practice with a collection of somewhat interrelated principles to act as guidelines for using materials efficiently and responsibly. Of these, the principles of cut, reuse and recycle are fundamental bases on which other circular activity is built. Cumulatively, these principles seek to minimize waste creation, product and material lifespans, as well as natural resource stress, in the service of sustainable development.

The reduction principle is aimed at production and consumption stages in order to prevent and reduce the quantum of resources used and also the waste generated. Waste minimization does not mean dealing with waste once it is generated: waste minimization aims to avoid the generation of waste from the start. This can be done through eco-design, better production processes and more responsible way of consuming. In resource-poor countries like Niger, minimizing inputs of energy and materials to the system is especially relevant as it will help reduce pressure on scarce resources while cutting costs and environmental burdens (Kirchherr et al., 2017; Murray et al., 2017).

Reduction also requires rethinking consumption culture, and disincentivizing overuse or abuse of goods. The promotion of long-life products, energy-efficient technologies and flexible systems demand for raw materials can greatly be reduced. From a developmental perspective, mitigation options are consistent with attempts at improving the efficiency of resource use that happen alongside economic activity and can be easily applied to low income economies which face structural constraints on resources.

Reuse, as a principle, supports other principles holding that reuse of appropriate existing materials is the most effective way to reduce consumption. Reuse solutions can be minor repair, refurbishment, repurposing and second-hand markets which result in delaying products into becoming waste. In Niger, reuse practices have become established in the everyday economy and specifically amongst

informal sectors that maintain repair and reuse as a necessity if not an environmental choice.

Reusing is motivational with respect to environmental and socio-economic aspects. Environmental in that it decreases the need for fresh resource mining and energy-intensive manufacture. Economically, it provides local jobs for artisans, repairmen and small-time vendors. By formalizing and promoting salvage practice through policy incentives and capacity building, Niger can rejuvenate local value chains while also promoting circular economy goals (Korhonen et al., 2018).

Recycling as a principle is about salvaging material from waste and returning them into production. Recycling decreases dependence on virgin raw materials, and reduces waste destined for landfills or illegal dumping. In Niger, recycling is particularly significant as waste are increasingly concentrated in urban areas and waste disposal facilities currently available have limited capacity.

Efficient recycling systems rely on the correct collection of waste, source separation and treatment facilities. We recognize that there are challenges but community recycling programs and the inclusion of informal waste pickers can make a huge difference for recycling. Recycling efforts, besides environmental advantages, have potential in creating employment and for poverty reduction by converting waste into wealth (Elia et al., 2017; Kalmykova et al., 2018).

In addition to the conventional reduce, reuse and recycle approach, circular economy approaches carry with them other complementary practices, such as remanufacturing (rebuilding a product that has reached its end-of-life), refurbishing (renovating an existing product) and recovering resources from waste. The difference between sono voiture and refurbishing is that the latter brings the used products back to use condition without repairing them fully. Resource recovery such as waste organic composting and materials valorisation from electronic waste also add values to the system (Dantas et al., 2021).

A coordinated public, private and community approach is necessary to successfully apply these principles. Governments have a key role in creating enabling regulations, incentives and infrastructure that encourage circular activities. Mean while, public awareness and education are important to promote behavioral change and support reuse and recycling behavior.

In Niger, the principles of reduction, reuse and recycling should be suited to local economic, social and ecological contexts. Circular economy solutions need to be practical and affordable and appropriate for communities.

When implemented effectively, such principles can help to improve resource efficiency, limit environmental deterioration and strengthen the economic inclusivity of economic development with a view toward promoting social-ecological resilience (Aminoff & Pihlajamaa 2020; Brown et al.)

3. Importance of Resource Efficiency and Waste Management

Resource efficiency and sound waste management are essential elements of circular economy model

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paths advancing sustainable development, especially in the case of resource-limited policies like Niger. By improving the way raw materials are extracted, used and reused, countries can reduce pressures on the environment while improving economic productivity and social well-being.

Resource efficiency is about doing more with less -- that is, producing more goods using fewer natural resources and generating less waste and pollution while minimising environmental degradation. Niger is one of the world's poorest countries, with very limited access to various resources like water, energy and fertile land which leads to inefficient use of such resources contributing to vulnerability to environmental and economic shocks. The nation stands to benefit from the adoption of resource-saving measures that could extend the life of current natural resources available and mitigate its reliance on expensive imports (Romero-Hernández & Romero, 2018).

Resource depletion is one of the earliest results of resource efficiency. Unsustainable patterns of extraction and consumption can result in chronic scarcity, jeopardizing peoples' livelihoods and halting development. Through material optimisation; recycling and reuse, resource efficiency contributes to the extension of life of natural resources and intergenerational equity. This is especially critical in Niger where a range of environmental adversities, including desertification and soil erosion, already represent considerable pressure on ecosystems (Hossain et al., 2020). Economically, increasing resource efficiency has a positive impact on productivity and competitiveness. Companies that use less material or energy are frequently more cost-efficient and operate more effectively. Such benefits can add to employment, income and economic resistance, particularly if efficient use of resources is integrated within local value chains.

Furthermore, resource efficiency stimulates innovation through new technologies, products and business models that are more relevant to sustainability.

Waste management is a parallel linchpin to the circular economy and resource efficiency. In Niger, poor garbage collecting and sorting methods has been leading to environmental pollution, public health hazards and loss of potentially valuable material. Mismanaged waste and open dumping pollute soil, water bodies, and the urban/peri-urban environment, leading to the spread of diseases.

Within this perspective, the risks described can be considerably limited by adopting efficient waste management with the virtual benefits of environmental and economical values. Waste minimization, separation, recycling and composting can prevent materials from ending up in the landfill and ultimately returning them to beneficial use. For example, organic waste can be turned into compost to increase soil fertility and some recyclable materials like plastic or metal can be recycled for industrial uses (Suárez-Eiroa et al., 201U).

Sustainable waste management generates social-economic benefits in addition to protecting the environment. Employment generation can come from the recycling and waste recovery sectors, as a new source of income for poor people (streetchildren, low income informal workers) who are already collecting waste. Systematising these functions through training, safeguards and

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institutional backing can enhance livelihoods and recycling systems. Moreover, cleaner cities are also associated with better quality of life (Misra & Pandey, 2005; Song et al.,2015) and health (Song et al., 2015).

Realising progress in resource use and waste management requires an integrated, coordinated approach. It is the responsibility of governments to create solid regulatory environment, invest in infrastructure for waste management and provide inducements measures for businesses and households to go sustainable. Public education and training efforts are also important to change behaviour and promote participation in the reduction and recycling of waste.

Resource productivity gains are also accomplished through technological innovation. The introduction of suitable technologies for resource recovery, waste treatment and energy production can help speed up the move towards a circular economy. Nevertheless, in a country such as Niger these technologies need to be cost-effective and

low-tech, flexible and orientated toward local capacity building with a proper alignment to needs (Provin et al., 2021).

To sum up, resource conservation and efficient waste utilisation are of great importance to sustainable development under the concept of a circular economy. These strategies provide practical solutions to some of Niger's most pressing development problems by addressing environmental decline, enhancing economic performance and creating social benefits. Their effective implementation is subject to a long-term policy commitment, participation by stakeholders and the ability to adapt to changing environmental and socio-economic conditions (Eslami et al., 201U).

4. Sustainable Resource Management in Niger

The analysis will highlight the challenges and opportunities related to consumption patterns.

Table 1. Key Socio-Economic and Demographic Trends in Niger (2001-2025)

Indicator	Average Value (2001-2025)	Key Trend	Relevance to Circular Economy
Population (millions)	11.5 (2001) →27.0 (2025)	Rapid, consistent increase (+135%)	Intensifying demand for resources, food, energy, and waste management services.
Urban Population (%)	1G.1% (2001) →18.0% (2025)	Steady urbanization	Concentrated waste generation in cities, necessitating formal and informal recycling systems.
GDP per capita (2015 US$)	~$3U3 (2001) → ~$5U5 (2025)	Slow, fluctuating growth	Highlights economic constraints; CE strategies must be low-cost and generate local value.

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Employment in Agriculture (%)	~80% (2001) →~71% (2025)	Gradual decline, remains dominant	Confirms agriculture as the core sector for applying circular bio-economy principles.

Source: (World Bank Group, 2025)

The numbers presented in Table 1 underscore

(i) the basic challenges and opportunities of a circular economy for or in Niger. The country's population has more than doubled since 2001, putting vast and mounting pressure on finite natural resources. Urbanization has been slow but the stationing of large numbers of the urban population in absolute terms over time have resulted in concentrated waste streams in cities such as Niamey--a fact confirmed directly in our qualitative case study (see Section 1.2.4.3). In addition, continued low GDP per capita means that models of the circular economy need to work at the level of survival and therefore balanced between job creation and cost savings over capital intensive high-tech solution. The strong orientation, in which more than 70% of the active population is involved, ties up this sector as seniors entry point for circular strategies such as nutrient recycling and agroecology towards sustainable development.

Comprehending the current flow of resources that sustain economic activities is imperative for developing policies and strategies for sustainable resource management in a circular economy context. In Niger, the use of resources depends on fast population growth, poor industrialization, restrictive climate conditions and significant reliance on natural capital. Together these factors shape how energy, water, land and raw materials are used across the economy.

Demographic change puts an enormous strain on Niger's resource stocks. The country has one of the highest population

Table 2. Selected Environmental and Resource Pressure Indicators

Indicator	Trend (2001-2022)	Implication for Circular Economy
Annual freshwater withdrawals (% of internal resources)	24% (2001) → 74% (2020)	Severe and increasing water stress. Demands circular water management (reuse, harvesting).
Forest area (% of land area)	1.05% (2001) →0.84% (2022)	Critical loss of biodiversity and ecosystem services. Reinforces need for sustainable biomass use and alternatives.
CO2 emissions (metric tons per capita)	Remains very low (<0.13)	Niger's circular transition is driven by adaptation and resource security, not

Source: (World Bank Group, 2025)

The numbers in Table 2 represent the harsh environmental limitations to which Niger is subjected. The vast expansion of fresh water withdrawal, almost 3/4 of internal resources by as early as 2020, illustrates the quantification that "…" emerged from the previous discussion on water scarcity.

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This trajectory transforms the circular economy's "close the water loop" – via effective irrigation, water-reuse and preservation – from a moral aspiration into an existential mandate. So is the continual reduction of forest cover which shows a genuine stress on biomass for power, closely echoing toward promoting circular energy solutions such as solar and biogas.

Remarkably, with Niger's low per capita CO2 emissions, the driver is not only climate mitigation, but also now an agenda of climate adaptation and resilience up to meeting basic needs for food security and increasing population.

The continued expansion of cultivated land has further driven deforestation and habitat degradation, decreasing ecosystem services and biodiversity. Without sustainable land practices, these dynamics jeopardize the longer-term sustainability of agriculture and rural livelihoods. The circular economy: practices such as agro-ecology, nutrient recycling and conservation agriculture form the basis for sustainable soil restoration while preserving productivity (Akcil et al., 201U; Nayak & Bhushan, 201U).

Consumption patterns in Niger are closely associated with the exploitation and utilisation of natural resources, such as uranium and gold. Dr HANNA - T HE "Fish Farm Industry" Other RESOURCE industries include Fisheries and Forestry These industries, contribute to the Nation's wealth However they are Sustainable (if managed correctly) but the resources that are extracted from them — such as FISH & TIMBER Many other non-renewable resource-based income sources in countries around globe do exist. Material losses and waste generation are an inherent problem in the preponderant use of linear extraction, use, disposal production models.

Moving towards circular material flows can mitigate a substantial portion of these inefficiencies through recycling, reuse and local processing. Improving the recovery of materials and promoting circular business models can maintain more value within the local economy and ecological impact of both extraction and disposal (Ewim et al., 2023).

In the final analysis, Niger's contemporary resource use reflects a combination of demographic pressures, ecological limitations and structural economic constraints. Although these challenges are significant they also identify obvious interventions for a circular economy. By enhancing energy efficiency, supporting sustainable water and land management, and adopting circular material use approaches, Niger can ease environmental pressures and enhance economic resilience.

Solving these challenges requires public-private-community partnership (Lieder, & Rashid 201G). Policy changes, ph ysical and human infrastructure investment, capacity building, and outreach are necessary to facilitate the transition to sustainable resource management. Against this backdrop, the circular economy gives a useful structure through which to harmonize resource use with the long-term development goals of Niger.

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5. Exploration of Renewable Energy Sources and Their Potential in Niger

The establishment of renewable resources will indeniably form part of the strategic options for the sustainable management of Niger's resources and thus be a cornerstone in developing our country. In light of the country's limited access to modern energy services, high reliance on biomass and vulnerability to climate variability, renewable energy has great potential for enhancing energy security while limiting harmful environmental impact.

Niger is well suited for the development of solar energy due to its geographic location and high annual insolation. With an average of more than 3,800 hours of sunshine per year, the one source that is most promising in terms of renewable energy in the land toward which Allah directed his servant throughout the earth's tighs nil with it". Photovoltaic systems can be implemented at multiple scales, from small distributed rooftop systems, to medium-sized residential and commercial rooftop installations, to large utility-scale photovoltaic power station. In rural and isolated areas, off-grid solar applications are of particular interest as they allow access to electricity while avoiding the need for expensive grid extension (Connaissance des Énergies, 2025).

The development of solar power is itself a direct contribution to the goals of the circular economy, reducing dependence on imported oil or gas and avoiding environmental damage caused by conventional energy. Apart from producing electricity, solar applications can be used for water pumping, irrigation and cooling of agricultural products which contribute to increased food security and rural incomes.

These multifunctional applications provide examples of how renewable resources can be included in a larger resource-efficient system. Wind Wind power Wind potential also exists in a few parts of Niger, especially in areas with good wind conditions like the Sahelian belt and selected highlands. Although little has been developed in the way of wind energy, early assessments suggest that small and mid-scale wind installations might be a good complement to solar power generation. A mixed renewable system from solar energy and wind generation could enhance reliability power condition because the distilled drinking water is a lifeline of residents in isolated community.

Another possibility is hydropower, but its potential is more limited in Niger because of the climate and also due to the scarcity of surface waters. If there are water resources, small-scale and run-of-river hydropower sites can be locally beneficial. Nevertheless, cautious environmental and social studies are needed to prevent the situation where hydropower development intensifies the water shortage or damages the ecosystem (Kristoffersen, et al., 2020).

NEGAH petroleum fuel NEGAH juice Greens: Energy Offset Folio niger Niger Cotton biomass NEGAH Biofuels This project makes and produces sustainable energy in gallons made at the top. Although the use of traditional biomass has caused deforestation and land degradation, new bioenergy technologies can convert agricultural residues, manure from animals and organic matter into cleaner source of energy. Biogas plants, for instance, can transform organic waste into cooking fuel and electricity and create nutrient-rich by-products for agriculture. This also closely

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adheres to circular economy principles of converting waste into valuable resources and easing pressure on natural forests.

The growing interest in geothermal energy also deserves attention, especially in areas that are characterized by geological units of the East African Rift System. Despite the fact that it is an exploration stage (Okunade et al., 2023) of geothermal development in Nigeria needs to be researched and evaluated, however there might be a possibility to harness it as reliable and low emitting energy resources which can cater for long term energy diversification (Fraga-Lamas et al., 2021).

To wind back from fossil fuels would result in a host of benefits other than clean air. Access to efficient and low cost energy can boost economic growth, lift up small and medium enterprises, improve access to education and health care services. In addition, RE creation can lead to job opportunities in installation, maintenance and system operations, advancing inclusive economic growth.

In this context of circular economy, renewable energy systems allow to organize an increasing better use of the resources: they produce less waste, reduce emissions and also encourage decentralized production paradigms. When combined with energy efficiency and resource recovery, renewable energy can contribute to decoupling development from environmental degradation, while enhancing the resilience of economies and society against external shocks.

However, there are barriers that prevent the development of renewable energy in Niger. These can be high initial investment costs, luck of finance availability, technical capacity constraints and inadequate enabling environments. Overcoming these challenges depends on a system-wide approach that includes governments and private investors, international partners, as well as local communities. Enabling policies and targeted incentives, capacity development programs, and technology transfer efforts are needed to unlock diffusion of renewable energies.

Conclusively, there is rhetoric that can be used to address a holistic scripting of electricity generation on RENs as one major component of sustainable resource management and circular economy in the Niger. Leveraging its rich solar resources, exploring synergies with other renewable forms and coordinating energy systems with wider development objectives, Niger can move towards a more resilient, low-carbon and resources efficient future (Urbinati et al., 2017).

G: sustainable waste management

Water saving is a key element of circular economy strategies in Niger, one of the most urgent environmental and social problems being that of the water scarcity. The country is situated in an arid and semi-arid climate, allowing for frequent drought periods with erratic rainfall patterns as well as a strain on limited fresh water by population increase.

These circumstances mean the efficient use, conservation and reuse of water are fundamental to long-term development and resilience.

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Agriculture is still the biggest user of water in Niger, and takes most of its water from surface and ground resources. Nevertheless, irrigation is inefficient and generally operates on old-fashioned principles leading to high wastage of water due to evaporation and leakage. As the world's population continues to grow, putting increasing pressure on global supplies of food, such inefficiencies in food production will simply be compounding the stress placed upon an already limited water resource. Increasing the efficiency of irrigation like that of drip or controlled flooding and water-efficient technologies are a key element in sustainable water use (Szerakowski, 2017).

Apart from agriculture, access to safe and dependable drinking water is also a major challenge particularly in rural areas and peri-urban settings. Weak infrastructure, poor storage and bad distribution result in uneven access and increased vulnerability durng dry periods. Therefore, more equitable access across regions and population is a critical goal of sustainable water management, which necessitates considering both supply and demand issues.

In addition to this, people need to take measures to protect and preserve sources of freshwater as a basis for sustainable water management in Niger. The grandeur of rivers, the sanctity of groundwater aquifers and wetlands is increasingly endangered due to over-extraction, pollution and land degradation. These pressures are potentially threatening the functioning of ecosystems and hence water availability over the long term without good governance and regulations. As a result, conservation measures including watershed protection, land-use planning and groundwater management are crucial to maintain water quality and quantities for future generations (Cilibert et al., 2021).

From the standpoint of a circular economy, water is no longer considered as a one-time resource but rather an inflow that can be returned to use and reintegrated into productive processes. There is also enormous potential for water recycling and reuse to alleviate stress on fresh water resources. And trated wastewater can be used for irrigation, landscape, and partial industry usage so water chain will last longer. In Niger, actions that encourage the treatment and reuse of wastewater are scarce; however, this is still a crucial issue for future interventions (Ewim et al., 2021; Ikwuagwu et al., 2020).

RWH is a now an eligible alternative for improving water supply, especially in rural and peri-urban sites. Rainwater harvesting can help communities store rain water during the wet season, reduce dependence on groundwater and enhance water security in times of shortage. Large-scale rainwater harvesting provides a viable means to facilitate local water supply, especially when supplemented with community level water management systems. Community engagement is one of the critical success factors water management and conservation programs. Water shortage has a direct effect on the lives of local populations, and community members are the best informants when it comes to water sources in use. Community involvement in decision-making, training on water conservation techniques and understanding of conservation concepts can foster ownership and contribute to the sustainability of water interventions.

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Good governance regimes are also critical. To avoid resource misuse and abuse, there is a need for transparent water policies backed up by strong regulatory mechanisms and shared with well-functioning institutions. In Niger, efforts towards enhanced water governance should be complemented by capacity building and knowledge provision in the domain of technical solutions including data availability, so as to fulfil evidence based decision making (Rajput & Singh 2021).

International cooperation also promotes the sustainability of water management in

transboundary water resources, which is often shared with neighboring countries. Working with local partners on the ground in the regions, international organizations bring knowledge transfer, financial support, and technical assistance necessary to conduct large scale water infrastructure and conservation projects.

In conclusion, sustainable water management and preservation are drivers for the development of circular economy schemes in Niger. Through greater efficiency, reuse, ecosystem protection and governance the nation can mitigate water stress while protecting agricultural productivity, public health and economic growth. Duonur/Ayagua/ Agua Xara: An opportunity to incorporate water management from a circular perspective and improve resilience and the sustainability and inclusiveness of development [41,42] The integration of water management within the concept of a circular economy increases resilience and can lead to more sustainable growth.

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