



Green jobs and rural labour markets: gendered pathways for decent work

O. Muza¹ | Consultant | Harare | Zimbabwe

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ABSTRACT

Climate change will lead to structural changes resulting from adaptation and mitigation directly, and also in the process of change from old to new jobs. Not much is known about the transition prospects of rural men and women. The ability of rural workers to cope is a key emerging transition issue which requires immediate attention in the green transition discourse, policy and practice. Using secondary information, the study maps key livelihood and labour market challenges related to climate change impacts in key sectors found in rural areas, including agriculture, forestry, fisheries, artisanal mining and tourism. The general equilibrium dashboard methodology/OECD indicators and key international instruments (ILO Solutions for Climate Action, Decent Work Measurement Framework and Canadian Labour Congress (CLC) Just Transition reveal decent work deficits in fundamental rights, employment creation, social protection and social dialogue. The study recommends gendered integrated rural labour market pathways that address greening uncertainties and promote decent work.

Keywords: Climate Change, Decent Work, Gender, General Equilibrium Dashboard Model, Green Jobs, International Standards, Labour Market, Resource Economics Rural

PAPER

1. Introduction

The primary source of income for most people in the world is returns to their labour, thus creating jobs and decent wages is essential to reductions in poverty and hunger (Norton, 2009). Important progress has been made in reducing the share of extreme working poor (those falling below US\$1.90-a-day threshold, 2011 PPP) in total employment over recent decades, particularly under the Millennium Development Goals (MDGs) from 33.2 per cent to 20.0 per cent, globally, over the period from 2000 to 2015. Despite continued improvements in reducing the shares of working poverty, efforts to reduce the absolute numbers of working poor at both thresholds have stalled. In 2015, an estimated 327 million employed people were living in extreme poverty at 967 million on moderate and near poverty. The absolute number has been falling by an annual average of 4.9% (extreme poor) and whereas it increased by 0.7% (moderately and near poor) over the period 2000 to 2015. Climate change will lead to structural changes resulting from adaptation and mitigation directly, and also in the process of change from old to new jobs (Olsen, 2009). Rurality, the traditional focus of food production enters the sustainable development policy debate in three policy contexts: firstly, the international farm crisis or its global environmental and trade repercussions, secondly, domestic policies attempting to redefine rurality beyond the confines of traditional agriculture policy and third and finally, policies for sustaining rural livelihoods that focus on promoting the viability of rural communities' infrastructure, education, health, social services and intergovernmental coordination (Wimberly, 1993). Green growth is one sector that is gaining support as a way to pursue economic growth and development, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use (OECD, 2010).

The concept of green jobs has evolved overtime and now recognises social equity as a key element. Bowen (2012) defines green jobs as occupations and skills with an identifiable environmental focus, but most focus is on employment in industries (or specific projects) the products of which are deemed to be of environmental benefit. Work in agricultural, manufacturing, research and development (R&D), administrative and service activities that contribute substantially to preserving and restoring environmental quality are green jobs (UNEP, 2011). Furthermore, jobs are green when they help reduce negative environmental impact ultimately leading to environmentally, economically and social sustainable enterprises and economies (ILO, 2013). More precisely, green jobs are decent jobs that reduce consumption of energy and raw materials, limit greenhouse gas emissions, minimise waste and pollution and protect and restore ecosystems (ILO, 2013). The decent work dimension of jobs in the environmental sector may be measured according to relevant indicators for instance, The Decent Work Indicators framework adopted at the International Conference of

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Labour Statisticians (ICLS) in December 2008. It covers ten substantive elements² corresponding to the four strategic pillars of the Decent Work Agenda (DWA): full and productive employment, fundamental rights at work, social protection and the promotion of social dialogue.

Rural workers in developing countries may be engaged in paid and/or unpaid forms of work, and their survival strategies often involve engaging in different forms of work to cope with the seasonal nature and different opportunities available as work for pay or profit. The heterogeneity of rural labour arrangements may include payment in kind (food or other goods), may involve conditional access to a piece of land, or may depend on other specified relationship between employers and workers that are determined by local customs or institutions. However, not much is known about the transition prospects of rural men and women. Literature evidence points out that the potential adverse impact of green growth policies on labour productivity and the costs of employment tend to be overlooked especially with regards to how labour markets work in different types of economies (Bowen, 2012). According to the ILO (2008) relatively little and superficial attention has been paid to the social dimension of sustainable development, in particular to the implications for employment and for decent work.

Activities in rural and informal sectors including agriculture, fisheries, forestry, tourism and artisanal mining are considered as environmental if environmentally sustainable technologies and practices are used (ICLS, 2008). However, labour market changes effected to jobs as the economy is oriented toward greater sustainability should also be assessed and measured for their decency. Firstly, what additional jobs are created, which employment is substituted, which jobs are eliminated without direct replacement and how are workers transformed and redefined as day-to-day skill sets, work methods and profiles are greened? Secondly, how are different gender groups in rural areas affected in particular women, who constitute a greater proportion of rural workers? Gender inequality in rural employment often exhibit different patterns according to social, cultural, religious and economic factors (FAO/ILO, 2010)³. Third and finally, is the transition process 'Just' in fulfilling the foundations of a greener and socially just economy considering issues of participation, job creation and maintenance, greening in training, education and skills, trade union rights and social protection.

Using climate change and green growth transition evidence this paper traces developments in key rural sectors including: agriculture, forestry, fisheries, tourism and artisanal mining to determine the relationship between rural labour markets and pathways to promote green growth, functionality and the implications for decent work. The rest of this paper is structured as follows: the next section presents the methodology followed by climate change impacts on key rural sectors. The pathways for green growth and transition evidence are presented next while the last section recommends key measures developed to deal with those impacts and how this will be further linked to local and international standards.

2. Methodology

Several methodological approaches are used; firstly, secondary data is used to understand the perceived effects of climate change on economic activity and employment in general secondly, using the general equilibrium dashboard methodology and the OECD's industry methodology; greening challenges in rural labour markets are outlined. Third and finally, ILO Solutions for Climate Change Action, Decent Work Measurement Framework and the Canadian Labour Congress (CLC) Just Transition methodologies are employed to argue the case for driving solutions for climate change and decent work. General equilibrium dashboard is a state in which all green jobs meet all criteria [organisational level: sector, product/service, production method, green awareness, position in the value chain and job level: occupational profile, required skills and abilities, job decency and green workload]. OECD's environmental industry definition and criteria, divides the environmental industry into 3 groups: pollution management [environmental equipment], green technology and product management group [technologies and processes for clean and efficient use of resources] and resource management group [businesses in the field of energy conservation, management and recycling]. The ILO solutions for climate action pathway guiding the development of this study posits that increased understanding of the climate change impacts on labour markets, lead to coherent climate change and decent work strategic and best practices for shared knowledge observing tripartisan and social dialogue for effective climate transition.

²The ten areas are: Employment opportunities (EMPL), adequate earnings and productive work (EARN), decent working time (TIME), Combining work, family and personal life (COMB), Work that should be abolished (ABOL), Stability and Security of Work (STAB), Equal opportunity and treatment in employment (EQUA), Safe Work Environment (SAFE), Social Security (SECU), social dialogue, workers and employers representation (DIAL), economic and social context for decent work (CONT). This framework has evolved since then and now includes one more area on the economic and social context (ILO, 2014).

³ Some of them such as- the burden of unpaid work at home, lack of education and bargaining power, and limited access to assets- clearly constitute significant economic disadvantages for women compared to men, women tend to be risk averse than men when engaging in rural employment and women's heavy burden of unpaid work is one of the most important factors constraining their access to unpaid work in rural settings and gender patterns of rural employment change over time and differ across countries in response to new trends, shocks and opportunities but some deep set gender inequalities remain. Changes in international trade, migration, financial crises and diversification of the rural economy are a few of the many phenomena that play an important role in changing men and women's rural employment opportunities and roles.

3. Climate change and sectoral labour market challenges

Climate change affects work in key sectors found in rural areas including agriculture, fisheries, forestry, tourism and artisanal mining. Direct and indirect impacts effect demand in the way work is done. The ability of rural workers to cope is a key emerging transition issue which requires immediate attention in the green transition discourse, policy and practice. As shall be shown in the next sections, gender influences different rural groupings transitioning prospects and possibilities.

3.1 Gender, climate change and labour market challenges

The green economy can be an opportunity for women to make strides towards gender equality in the workplace through better paid, non-traditional jobs. A combination of innovative strategies is needed so that women as well as men can benefit from the green economy (Stevens, 2009). This involves a paradigm shift to link the environmental and social consciousness of women with the range of jobs, including manual labour and technical positions, expected to be generated from the shift to a green economy⁴.

Globally, women are more likely to be affected by environmental degradation and climate change (ILO, 2012). In the developing world, climate change can intensify the pre-existing inequalities between men and women (Chagutah, 2010; Madzvamuse, 2010). Women predominate among the poorest and are disproportionately concentrated in agriculture and tourism, sectors which depend on natural resources and are often characterised by poor pay and other decent work challenges (ILO, 2012). The consequences are growing risks to rural livelihoods, declining productivity, poverty and insecurity, conflict over access to resources and rural-urban migration; factors which have underlying socio-economic risk factors leading to the vulnerability of women (see Table 1).

Table 1: Climate change, gender and vulnerability in rural labour markets

Climate impact	Underlying socio-economic risk factors	Vulnerability of women
Crop failure	A greater proportion of rural women are small holder farmers (for instance, 70% in Zimbabwe)	Strain on food provision Increased workload
Shortage of safe, clean drinking water	Gendered division of household labour	Additional time required to travel greater distances to collect water from alternative sources, which may not be clean/safe Exposed to violence/sexual abuse when travelling to and from water sources
Disease	Gender division of reproductive labour/ care given Cultural restraints on mobility	Additional time required to care for young, sick and elderly Women of all ages lack health care access
Migration	Males may contribute little to household income (e.g. remittances) Women who become de facto household heads may face difficulties in retaining control over land and other productive assets due to unequal property and land rights	Increased domestic/agricultural load Decreased coping capacity and insecurity of tenure
Disaster	Women and children often lack skills, knowledge and resources	Women and children are likely to die than men during disaster events
Displacement	Particular problems in temporary housing/relocation sites	Women and girls face higher rates of sexual abuse and violence
Resource Scarcity	70% of the world's poor are women Women have lower levels of educational attainment Women are over represented in the informal sector Women earn lower wages and have limited access to markets	Limited time and resources to invest in more resilient land and shelter Limited resources to invest in alternative livelihoods

Source: Chagutah (2010)

From a global perspective, primary sectors, including agriculture and forestry, are expected to be major beneficiaries of the transition to a low carbon economy. However, women comprise less than 20% of the global formal workforce in primary sectors and around 2% in developed countries (Stevens, 2009). The estimated share of female employees'/women in green jobs in relation to all employees in farming/fisheries/forestry is 20%, while 8% are in natural resources (including mining and quarrying). Women in green jobs are concentrated in administrative services at 68% (see Table 2).

⁴ Ibid.

Table 2: Women in green job sectors

Sector	Components	Estimated share of female employees (2009)
Primary	Farming/fisheries/forestry	20%
	Natural Resource	8%
Secondary	Manufacturing	24%
	Construction	9%
Tertiary	Engineering Services	12%
	Financial and Business Services	15%
	Eco-tourism	20%
	Eco-tourism	20%

Source: Stevens, (2009)⁵

3.2 Agriculture, climate change and labour market challenges

Climate change has materialised as the leading global environmental concern of which agriculture is one of the zones most critically distressed by climate alteration (Joshia and Chartuverdi, 2013). As global temperature rises and climate conditions become more erratic posing threat to vegetation, biodiversity, biological progression they have enduring effect on food security as well as human health⁶. Doubling of the atmospheric carbon dioxide concentration will lead to only a small decrease in global crop production but developing countries are likely to bear the brunt of the problem and similarities of the effect of adaptive measures by farmers imply that these will do little to reduce the disparity between developed and developing countries⁷.

A robust model of yield response to climate change for several African crops illustrates that by mid-century, the mean estimates of aggregate production changes in Sub Saharan Africa under the preferred model specification are -22%, -17%, -17%, -18% and -8% for maize, sorghum, millet, groundnut and cassava respectively (Rosenzweig and Parry, 1994). In all cases except cassava, there is a 95% probability that damages exceed 7% and a 5% probability that they exceed 27%⁸. Moreover, countries with highest average yields have the largest projected yield losses, suggesting that well-fertilized modern seed varieties are susceptible to heat related losses.

Some of the most important impacts of global climate change will be felt among the populations, predominantly in developing countries referred to as 'subsistence' or 'smallholder' (Morton, 2007). Their vulnerability to climate change comes from being predominantly located in the tropics and from various socioeconomic, demographic and policy trends limiting their capacity to adapt to climate change⁹. Morton (2007) suggests small farm sizes, low technology, low capitalisation and diverse nonclimatic stressors as increasing vulnerability but resilience factors- family labour, existing patterns of diversification away from agriculture and possession of a store of indigenous knowledge should not be underestimated¹⁰.

Thompson and Cohen (2012) add that many of the poorest and most vulnerable people are women living in rural areas in developing countries who are wholly depended on subsistence agriculture to feed their families. Rural women, female smallholders in particular, may be disadvantaged in terms of access to key productive assets for farming and services such as land, water, rural infrastructure, technology and information, credit and extension services (World Bank, FAO and IFAD, 2008, Brody et al. 2008). These women therefore tend to have limited adaptive capacities, and are highly dependent on climate sensitive resources such as local water and food supplies (IPCC, 2007). Climate change is expected to exacerbate these gender inequalities with women being disproportionately affected by depletion of natural resources and reduced agriculture productivity (Parikh and Denton, 2002).

One effect of climate change relevant to rural employment is related to the risk of declining farm yields of which the gender-differentiated impact will depend on multiple factors, including which crops women produce, as well as their ability to adapt and respond (Cabrera de González et al., 2009). Three critical impacts on women are firstly; female farmers' ability to develop effective coping strategies might be limited compared to male farmers because of their more restricted access to productive resources

⁵ Statistics provided in this table are based on ILO estimates 2007 (SustainLabour, 2009) and as such are consistent with the ICLS definition of decent jobs adopted in this paper.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

such as technology, knowledge and inputs. Secondly, climate change might worsen the conditions of the wage agricultural labourers, if in response to it; large producers expand informal employment and increase the use of pesticides. Third and finally, climate change might also increase women's unpaid workload, further reducing their opportunities for paid employment, in areas affected by desertification where time required for water collection might increase.

In general, both mitigation and adaptation policies are likely to have gender differentiated effects on employment that need to be better understood, i.e. environmental labelling, if discouraging the purchase of fruits and vegetables from developing countries, may have negative employment effects on female-intensive non-traditional export industries¹¹. Climate policies can contribute to rising demand for educated and qualified workers through promoting environmentally sound technologies. However, because of women's lower levels of education in many countries, women are less likely to benefit from such demand unless the relevant training is made available to them¹².

3.2 Forestry, climate change and labour market challenges

In general, women are the primary users of environmental resources for subsistence and income generating products, yet in many cases have no say in how the resources are accessed, controlled or shared (Makonese and Tsanga, 2008). Forests can play an important role in complementing agricultural production to address ambitious global goals and reducing hunger and achieving food security and improved nutrition (Vira et al., 2015). Additionally, forests and trees can be managed to produce better and more nutritionally-balanced diets, offer greater control over food inputs and deliver ecosystem services for crop production¹³. Some 410 million indigenous people and communities depend on forests for their livelihood (ILO, 2012). Globally, 70% of forest products are sourced from 7% of the world forest, of which the latter are predominantly planted or have a planted component (Dale et al. 2009). Additionally, climate change can affect forests by altering the frequency, intensity, duration and timing of fire, drought, and introduced species, insect and pathogen outbreaks, and hurricanes.

Deforestation and land uses including degradation from mining, oil and gas concessions are reported to account 11% of annual global greenhouse gas emissions (Stevens et al., 2014). Legal protection for woodlot communities is therefore not just a land or resource rights problem, but also a climate change problem (Muza, 2016). In the context of high level of forest dependence, challenges of State and NGO-led re-greening practices are inadequate involvement of communities, poorly defined rehabilitation objectives, lack of management plans, unclear responsibilities and benefit sharing arrangements and poor structural activities (Lemenih and Kassa, 2014).

Lessons include a more active role for non-state actors in greening initiatives, more attention to market signals, devolution of management responsibility and clear definition of responsibilities, benefit-sharing arrangements, and better tenure security. It seems that market signals have led to the destruction of rainforests which have been supplanted in places like the Amazon in Brazil by cattle farming and crop production. It seems that government protection and support by civil society (researchers, NGOs) is needed to ensure sustainable forest management.

3.3 Fisheries, climate change and labour market challenges

Fisheries and aquaculture are important sources for food and livelihoods for people along the world's seashores and waterways (Smith et al., 2010), and influence the livelihoods of one billion people. Almost 45 million people worldwide are directly engaged, full time or part time, in the fishery primary sector and an additional estimated 135 million people employed in the secondary sector, including post-harvest activities (Mathiesen, 2012). Information provided to FAO from 86 countries indicates that, in 2008, 5.4 million women worked as fishers and fish farmers in the primary sector and represented 12 percent of the total¹⁴. In two major producing countries, China and India, women represented 21 percent and 24 percent, respectively, of all fishers and fish farmers¹⁵. Women make up at least 50 percent of the workforce in inland fisheries, while as much as 60 percent of seafood is marketed by women in Asia and West Africa¹⁶. Moreover, although comprehensive data are not available on a sex-disaggregated basis, case studies suggest that women may comprise up to 30 percent of all those employed in fisheries, including primary and secondary activities¹⁷. Aquaculture has been the fastest growing food production sector for the past 4 years, and supplies more than half of the world's food fish (UNEP, 2012). Excluding aquatic plants, aquaculture production reached 52.5 million tonnes representing a value of US 98.5 million in 2008¹⁸. It has been estimated that 52 million are employed in marine small-holder capture fisheries (and another 56 million in small-scale inland fisheries). Many involved in these sectors are recognizing that it is vital to look beyond the simplified picture of men as fishers and women as

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

processors and to examine the more complex picture of multifaceted relationships between men and women as boat owners, processors, sellers, family members, community members and co-workers (Mathiesen, 2012). Gender issues in the fisheries and aquaculture sector have seldom been examined, and the important role women that play has often been overlooked and, thus, not taken into account in decision-making processes and outcomes, thereby hindering development for instance:¹⁹

1. Men and women engage in distinct and often complementary activities that are strongly influenced by the social, cultural and economic contexts in which they live.
2. Male–female relations in the fisheries sector vary greatly and are based on economic status, power relations and access to resources.
3. In most regions, women have rarely participated in commercial offshore and long-distance capture fishing. Ocean-going boats for offshore deep-sea fishing have male crews – not only because of the vigorous work involved, but also because of women’s domestic responsibilities and/or social norms.
4. More commonly, in coastal artisanal fishing communities, women manage the smaller boats and canoes that go out fishing. Women are also involved in gathering shells, sea cucumbers and aquatic plants in the intertidal zone. They also contribute as entrepreneurs and provide labour before, during and after the catch in both artisanal and commercial fisheries. In addition, they are often responsible for skilled and time-consuming onshore tasks, such as net making and mending, processing and marketing catches, and providing auxiliary services to the boats.

Climate change will affect fisheries availability, stability, access and utilization (Labour S., 2013). Availability will be impacted as aquatic foods will vary through changes in habitats, stocks and species distribution. Stability of supply will be impacted by changes in seasonality, increased variance in ecosystem productivity and increased supply variability and risks. Access to aquatic foods will be affected by changes in livelihoods and catching or farming opportunities and utilization of aquatic products will also be impacted and, for example, some societies and communities will need to adjust to species not traditionally consumed. Aquatic foods have high nutritional quality contributing 20% or more of average per capita animal protein intake for many poorer countries. Climate change will affect food quality as food resources come under greater pressure and the availability and access to fish supplies will become an increasingly critical development issue. Climate change is a compounding threat to the sustainability of capture fisheries and aquaculture development (Cochrane et al., 2012), see also Table 3.

Table 3: Climate change effect on fisheries livelihoods and labour market challenges

Climate change effect	Livelihoods/Labour Market Issues
Less predictable rain/dry seasons-decreased ability to plan livelihoods activities-e.g. farming and fishing seasons	Increasing vulnerability of riparian and floodplain households and communities Livelihood strategies will have to be modified, for example, with changes in fishers migration patterns due to changes in the timing of fishing
More droughts or floods- damage to productive assets (fish ponds, weirs, rice fields etc and homes)	Increasing vulnerability of riparian and floodplain households and communities
Changing levels of precipitation where rainfall decreases reduced opportunities for farming, fishing and aquaculture as part of rural livelihoods systems	Reduced diversity of rural livelihoods, greater risks in agriculture greater reliance on non-farm income. There are particular gender dimensions, including competition for resource access, risk from extreme events and occupational change in areas such as markets, distribution and processing, in which women currently play a significant role Displacement of populations into coastal areas leading to influx of new fishers
Water stress and competition of water resources	Affect aquaculture operations and inland fisheries production, and are likely to increase conflicts among water-dependent activities
Extreme events	Impact on infrastructure, ranging from landing and farming sites to post harvest facilities and transport routes. They will also affect settlements, with communities living in low-lying areas at particular risk
Changes in distribution species	Composition and habitats will require changes in fishing practices and aquaculture operations, as well as in the location of landing, farming and processing facilities

Source: Chagutah (2010)

3.4. Tourism, climate change and labour market challenges

Travel and tourism’s impact on the economic and social impact of a country can be enormous: opening it up for business, trade and capital investment, creating jobs and entrepreneurialism for the workforce and protecting heritage and cultural values (Mowforth and Munt, 2015). Travel and tourism generated

¹⁹ Ibid.

US\$7.6 trillion (10% of global GDP) and 277 million jobs (1 in 11 jobs) for the global economy in 2014²⁰.

Tourism is a climate-dependent industry and so many destinations owe their popularity to their pleasant climates during traditional holiday seasons (Amelung et al., 2007). The Tourism Climatic Index (TCI) reveals that the locations of climatically ideal tourism conditions are likely to shift poleward under projected climate change²¹. Tourism is currently considered among the economic sectors least prepared for the risks and opportunities posed by climate change and is only now developing the capacity to advance knowledge necessary to inform business, communities and government about the issues and potential ways forward (Scott, 2011). At a global scale, climate change will ultimately lead to welfare loss, unevenly spread across regions (Bigano, 2004). Tourism is increasing contribution to climate change, especially through the use of air travel (Becken, 2007).

According to the UNWTO, women make up the majority of the tourism workforce, but they tend to be in the lowest paid, sometimes even un-paid, and lowest status jobs. Strong associations persist in the popular imagination between tourism and prostitution (Ferguson, 2009). Indeed for many, this is the extent of gender issues in tourism²². Certainly, the sexual exploitation of women and children is a serious issue that needs to be addressed and the emerging phenomenon of sex tourism in developing countries has been extensively researched by feminists (Pettman, 1997; Jeffreys, 1999). Sexual exploitation of children in tourism occurs in multiple tourism destinations and even in places which do not have any real tourism infrastructure (ECPAT, 2008)²³. Many African countries have encouraged tourism to attract foreign investment and to fund infrastructure development²⁴. While this, coupled with a renewed focus on Africa from tourist-sending countries has sparked tourism growth on the African continent, this growth has predictably, been accompanied by an increase in child sex tourism (CST). Victims of CST are often caught in poverty, from minority groups, dependent on seasonal economies, working children, children living on the street and children abused or neglected in the home and AIDS orphans.

Scholars within tourism studies have long argued that tourism is a highly gendered industry (Kinniard et al., 1994; Kinniard and Hall, 1994). Research has identified a clear segmentation of men's and women's work in tourism. The majority of women's work is concentrated in seasonal, part time, low paid activities such as retail, hospitality and cleaning (Sinclair 1997; Chant 1977). Global gender inequalities are embedded within the promotion and marketing as tourism destinations (Ferguson, 2009). There are 2 distinct ways in which gendered assumptions operate in tourism development policy; implicitly (gender blind) and gender aware²⁵. Gender blind involve how macro-level tourism development policy relies on gender inequalities embedded in processes of restructuring of the global economy. Gender aware aspects of tourism development policy; focus on policies which openly seek to affect change in gender equality or promoting women's empowerment.

3.5. Artisanal mining, climate change and labour market challenges

Mining is an important economic activity in many developed and developing countries. The formal mining sector employs more than 3.7 million workers. In addition, more than 20 million people work in artisanal and small-scale mining (ASM) (Hentschel, 2002). In 2010, 1.5 million people were employed in the mining sector in developed nations, and 2.2 million in developing/emerging nations (Hruschka and Echavarría, 2011). The number of people working in mining jobs dropped significantly during the 2008 recession, although many of these jobs have since returned²⁶. In addition, artisanal and small-scale mining employs an estimated 25 million people worldwide, and indirectly supports more than 150 million people²⁷. Mining takes place in more than 100 countries, with more than 50 regarded by the World Bank as "mining countries" because of the importance of mining to their exports, domestic markets, or to employment.

A changing climate presents physical risks to mining and metals operations because these industries are often located in challenging geographies, relying on fixed assets with long lifetimes, involve global supply chains, manage climate-sensitive water and energy resources, and balance the interests of various stakeholders (International Council on Mining and Metals, 2013). A key transition issue is around the opportunity to turn the industry into an agent of change and solution providers, rather than a generator of unsustainable lock-ins and a resisting force (Mont Masson-Clair, 2015). While the impact of climate change on large scale and small scale mining may vary in terms of scale, the impact on workers is more or less the same. Natural disasters pose immediate health and safety risks, while warmer temperatures may attract worker recruitment, retention, safety and productivity by increasing risks of accidents, creating or exacerbating food and water shortages and causing greater prevalence of disease (Table 4).

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ http://www.ecpat.org/wp-content/uploads/legacy/cst_faq_eng.pdf.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ <http://www.miningfacts.org/Economy/How-many-jobs-depend-on-the-mining-industry/>.

Table 4: Climate change effect in mining labour markets

Climate change effect	Labour Market Issues
Rising temperatures flooding, natural disasters, and drought	Increases the risk of heart-related illnesses and inhibit decision-making increasing the likelihood of injuries, accidents, and fatalities and decreasing productivity.
	Underground cooling systems may be inadequate to handle changes in temperatures and availability of water and energy
	Increase the incidence, prevalence and geographic reach of tropical diseases such as malaria, yellow fever, cholera and schistosomiasis with consequences for workforce health Flooding and rising temperature will increase the spread of tropical diseases that affect community health
	Undermine food security and rising temperatures will exacerbate water shortages, undermining worker health and productivity
	Increased requests for financial and employee support, in response to natural disasters in host communities
	Damage to livelihoods and poverty will elevate the need for basic services and restoration of economic activity. If these are also home communities for employee and contractor workforces, such incidences will directly affect worker health attendance and productivity
	Increased requests for financial and employee support, in response to natural disasters in host communities
	Drought, extreme weather, and flooding may decrease food security, worsen poverty, induce migration, contribute to civil unrest and increase conflict over resources
	Community water infrastructure and watershed restoration projects may be required to mitigate reputational risks and to meet needs of all users
	Force migration of coastal peoples, whose movement to new areas may exacerbate social problems and conflicts in host communities

Source: Adapted from International Council on Mining and Metals, 2013

Due to the illegality of their operations, artisanal miners cannot access official markets and depend on intermediary traders²⁸. Their minerals are also deemed unattractive by fair trade organizations due to their environmentally degrading activities. They face the constant risk of being arrested too. In essence, artisanal miners face many risks and challenges only to make less money than the people they sell their minerals to. Not only are they at the risk of rock-falls, shaft collapses, water-borne diseases, animal attacks and injury, they also fall victim to turf wars and harassment from peers. They work on low-value ore-bodies while using labour intensive equipment and inefficient processing techniques which result in very low recoveries. They lack adequate geological knowledge of the ore-bodies and do not possess adequate mining skills. They have very little knowledge of the economic principles that govern the extraction industry and as a result their operations are run on a 'Gambler Mentality'.

The vulnerability of artisanal miners and women in particular is high during droughts or economic crises (Muza, 2009). In Zimbabwe for instance, women, who constitute 30% of artisanal miners also face some gender-specific challenges²⁹. They are harassed by male counterparts including gold dealers in the sector. Although all artisanal miners suffer police arrests, the women's situation is worse in that because of the family care roles they play, they are sometimes forced to negotiate for 'lighter' charges outside the law. This is perpetuated by structural inequalities and stereotypes that discriminate against women, especially the misconception that the mining sector is a preserve of men. This is so despite the fact that women are disproportionately overwhelmed by negative impacts of mining, such as loss of agricultural land, unequal employment opportunities, increased incidences of Sexual Transmitted Infections (STIs), teenage pregnancies, access to clean and safe water and climate change which has affected subsistence farming, ultimately removing the guarantee of putting food on the table.

4. Pathways for green transitioning in key rural sectors: the case of Zimbabwe

Zimbabwe is severely vulnerable to climate change and its vulnerability is set to increase between 2010 and 2030 (DARA; Climate Vulnerability Monitor, 2012). It is ranked 156th on the Human Development Index (UNDP; Human Development Index, 2014). Zimbabwe's CO₂ emissions are 0.7 tonnes per capita, while the global average is 4.9 tonnes per capita (World Bank; World Development Indicators: Energy dependency, efficiency and carbon dioxide emissions, 2010). There are consequences of not changing the current policies for industries with a greater environmental impact. Green growth pathways in Zimbabwe have largely focused on climate adaptation and mitigation strategies in ecotourism, reforestation, land and water management, organic agriculture, the development of clean sources of energy, recycling of green waste, green mining and green growth fisheries and aquaculture.

²⁸ <https://projekt263.wordpress.com/2013/09/24/formalising-zimbabwes-artisanal-mining-sector/>.

²⁹ http://www.zela.org/index.php/latest-news/46-engendering-policy-in-the-artisanal-and-small-scale-mining-sector-in-zimbabwe#_ftn2.

4.1 Organic agriculture

Organic Agriculture (OA) initiatives in Zimbabwe are mainly developed by farming communities similar to those in Kenya and South Africa (Parrott and Elzakker, 2003). While increased uptake of OA on food supply and food security depend on geographical and socio-economic conditions and on the scale considered (Halberg et al. 2006), ethical concerns are significant drivers of integrated crop protection (IP) and organic farming (OA). However, animal manure shortage, slow organic matter decomposition and high labour requirements constrain OA (Svotwa et al. 2009). Evidence from the Organic Conservation Agriculture (OCA) project shows a high proportion of women (65.5%) engaged in the OCA project, despite not having used affirmative processes to increase participation which points to a number of factors, including the organic appeal to women producers (combined OA with TK); a higher proportion of women in the communal areas due to work opportunities for the men-folk; and or the majority of men in the household are watching to see if OA offers opportunities before fully engaged (McAllister, 2012). Of the engaged OCA farmers, 66% of the household are male headed households, 44% are female headed with a small number of child headed households. One of the most successful associations is led by a woman. In most cases, the females heading households are either widowed or divorced. However, the highest percentage of women actively participating in OA are within traditional family structures, with their lack of control over resources, asset and income being a key limiting factor, and posing a challenge for them expanding their enterprises.

Through a Global Environment Facility's biodiversity thematic area³⁰ implemented in two phases from 2006 and 2011, 400 members from Makoni Organic Farmers Association (MOFA) have received organic farming skills training in the application of crop rotation, livestock and green manure, composting, mulches and cover crops. The project links farmers efforts to upstream policy measures such as the national waste strategy and biodiversity strategies, the forestry based and wildlife land reform policies, as well as the environment and natural resources strategic plan for the period 2011 – 2015³¹. The 450 member project won coveted Equator Prize 2014. Research on unlocking the organic potential of Zimbabwe suggests key recommendations addressing some decent work indicators including firstly, a national agricultural policy which provides for organic farming, organic farming training, budgetary support and loan facilities. Secondly, an educational policy that provides for curricula on organic farming education at all levels. Thirdly, national organic promotion, processing and marketing policies linked to international (IFOAM), regional (CAADP), sub-regional (RISDP), and national (ZOPPA, SAZ); Fourthly, affordable registration costs and efficient processes and fifth and finally quality relationships between key stakeholder groups that include policy makers, policy implementers, research institutions, private sector as buyers, technology suppliers and NGOs.

4.2 Recycling of agriculture waste, land and water management and clean energy sources

Provision of clean energy sources, recycling of agricultural waste, land and water management are other pathways for greening the Zimbabwean economy. Reduction of green house gas (GHG) emissions emerges as a key mitigation factor in rural economies. Livestock generate GHG mainly in the form of methane emissions arising from digestion processes and nitrous oxide emissions arising from excretions. The cultivation of crops contributes to the concentration of greenhouse gases mainly by requiring the use of fertiliser as well as emitting nitrous oxide from crop residues reintroduced into the ground. Mining pollutes water and land and also contribute to GHG emissions. Forestry emissions are driven by deforestation for agriculture land and forest degradation due to fuel wood consumption as well as formal and informal logging. Tourism increases contribution to climate change, especially through the use of air travel (Becken, 2007). The global air travel tax emerged as a realistic compromise between restricting travel and achieving emissions reduction.

A new recycling company Clean and Green Zimbabwe was launched with a vision to maximize on recyclable recoveries. The company has directly created more than 70 jobs dire directly and indirectly unemployed youth are earning an income by selling their waste to the organisation. The company has so far collected 350 tonnes of waste³². The country's waste management strategies employ the traditional closed system which focuses only on the collection, transportation and disposal of waste. The system is failing to cope with the large amounts of waste being generated and noted that there was need to employ a more sustainable approach anchored on the reduction and recycle principles. Another organisation, Environment Africa (EA) is pushing the concept of waste separation at source, use of colour-coded bins and liners for waste separation and ultimately recycling. Waste is segregated according to type and recyclability from the waste stream at point of generation or source. Recyclable wastes include paper, glass, plastic, polystyrene, cans or tins and biodegradable waste³³. Enterprising young minds from Sakubva a high density suburb in Zimbabwe's Mutare city came together to venture into an indigenous waste management company called Mutare Plastic Recycling Centre. It is the first of

³⁰ Supported by the Global Environment Facility's Small Grants Programme (GEFSGP) of UNDP, the farmers are leading the way in environmental conservation and sustainable use of resources for livelihood improvement and poverty reduction.

³¹ http://www.zw.undp.org/content/zimbabwe/en/home/ourwork/environmentandenergy/successstories/sky_s-the-limit-for-new-crop-of-organic-farmers-in-zimbabwe.html.

³² <http://www.hararenews.co.zw/2014/07/clean-and-green-zimbabwe-new-recycling-initiative-launches/>.

³³ <https://www.newsday.co.zw/2013/10/19/zimbabwe-waste-management-strategies-new-wine-old-skins/>.

its kind in the city. The youths are not yet able to add value to the recycled plastic, so they sell it mainly as pellets or raw plastic to companies mostly in Harare, where it is used to make irrigation pipes, plastic bags, lunch boxes and other plastic products³⁴.

In rural areas of Zimbabwe, 80-90% of people are heavily dependent on wood fuel, light their homes with kerosene, and carry out essential food processing tasks, such as milling grain, using diesel-powered systems. Total electricity generation in 2009 stood at 7,900 GWh, of which 53.3%, or 4,303 GWh, was produced from renewable sources. Electricity consumption per capita in 2009 stood at 1,022 kWh (REEEP, 2012)³⁵. Zimbabwe could move forward to a renewable revolution and create job opportunities by improving access to financing new renewable energy technologies and realizing Zimbabwe's capacity to create job opportunities in renewable energy sector (IRENA, 2014). According to IRENA, in 2014 an estimated 7.7 million people worked directly or indirectly in the sector, with an additional 1.5 million in large-scale hydropower. Solar PV is the largest employer, with 2.5 million jobs. Zimbabwe has abundant sunshine throughout the year and has a high potential in Solar PV³⁶.

4.3 Eco-tourism

In 2014, travel and tourism's direct contribution to employment was 181.000 jobs while total contribution to employment was 426 200 (Mowforth and Munt, 2015). With decreasing rainfall and rising temperatures, significant declines in biodiversity are expected to occur in most parts of the country especially the western regions where most of the estates are located. Ecotourism is defined as 'responsible travel to natural resources areas that conserves the environment and sustains the well-being of local people' (Stevens, 2009). The ecotourism green pathway in Zimbabwe stresses community participation in decision-making processes in relation to eco-touristic ventures and subsequent benefits derived from such ventures flowing back to local communities (Muzvidziwa, 2013). Eco-tourism places emphasis on conservation through utilisation, instead of emphasising preservation only. It helps conservation of natural environment and enhances the socio-economic lives of the local community. It is a strategy with potential to mostly benefit locally disadvantaged and marginalised communities living near or around tourist areas. Primary school curriculum and traditional conservation methods strengthen ecotourism (Marunda and Chaneta, 2014). Good governance, positive international relations and policies remain major factors in determining the overall viability and sustainability of the ecotourism sector, hence facilitating sustainable development (Chiutsi, 2011).

In order to promote gender equality, support opportunities for women and end violence against women, it is important to empower women as a first step³⁷. Women are involved in eco-tourism through the preservation of forests, rivers and lakes and also participate in responsible nature industries. Amagugu International Heritage Centre in Bulawayo whose motto is 'where culture and nature meet' promotes women enterprises including crafts making and participatory cultural activities³⁸. The tourism industry can contribute to this effort by creating opportunities for women and spread awareness of gender issues. Having economic opportunities and education is one of the most important ways for women to empower themselves to seek a better quality of life for themselves, their families and their communities³⁹.

4.4 Reforestation.

In Zimbabwe, women need environmental resources and in particular forest produce like fruits, roots, leaves and insects for food and medicine, firewood for heating and lighting, grass for thatching their huts and many other uses (Makonese and Tsanga, 2008). Protecting and re-establishing forests for their economic and ecosystem services including carbon stocks is a key green pathway. 66% of Zimbabwe's land area is under various forest types compared with 27% which is under cultivation. Exotic plantations occupy about 156 000 ha of land of which over 90% is in the Eastern Districts. The heaviest concentrations of forests occur in the gazetted state of forest areas, national parks areas, the eastern highlands and large scale commercial farms. On the other hand, the woody vegetation cover in most communal areas is low and variable with heavily populated districts such as Mutasa and Chivi having only 26% and 30% covered respectively. Though woodlots establishment is gaining momentum as a key rural sector providing employment to rural men and women (Muza, 2016), key decent work indicators would need to be recognised, especially improving security of tenure for women.

4.5 Green Mining

Up to 2 million people are affected by artisanal mining in Zimbabwe. These people are mostly involved in the extraction of gold, diamonds, tantalite and chrome. 500 000 people are directly involved in artisanal mining with over 150 000 of them being children and women. The World Economic Forum ranked

³⁴ <http://www.thezimbabwean.co/2015/03/youths-live-off-plastic-recycling/>.

³⁵ <http://www.reeep.org/zimbabwe-2012>.

³⁶ <https://www.newsday.co.zw/2015/07/31/zims-potential-to-move-towards-a-renewable-clean-energy-revolution/>.

³⁷ <https://www.ecotourism.org/news/tourism-and-gender-how-can-tourism-help-empower-women-and-promote-gender-equality>.

³⁸ www.amaguguheritage.org.

³⁹ <https://www.ecotourism.org/news/tourism-and-gender-how-can-tourism-help-empower-women-and-promote-gender-equality>.

Zimbabwe 88 out of 135 countries in its Gender Gap Index 2011, a position relatively consistent with its gender blind policies in key economic sectors like mining⁴⁰. The misconception that the mining sector is a preserve of men has further undermined policy responsiveness to gender-specific challenges faced by women in mining who now constitute 30% of artisanal miners in Zimbabwe⁴¹.

Green mining activities involve, shutting down illegal and unregulated mines, choosing environmentally friendly general mining processes, implementing recently discovered green mining technologies, cleaning up the sites of shut-down mines, re-evaluating cut-off grades and research and development of green mining technology⁴². Two major methods of implementing green mining reform are governmental regulation and innovative technologies⁴³. Poor governance practices in the mining sector precipitated hazardous mining practices with severe ecological damages and human rights violations on communities living in mining areas. In Manicaland Province for example, alluvial diamond and gold mining activities in Chimanimani, Marange and Penhalonga has exposed communities to environmental degradation, water pollution, forced displacements and loss of livelihoods (CRD Report, 2014). Attempts by communities living in mining areas to fight for their rights to a secured environment has been met with brutality by mining companies leading to loss of life in some instances⁴⁴.

Apart from direct labour market impacts related to mining activities in general, landmines also threaten rural livelihoods, Zimbabwe has one of the densest minefields in the world, with about 5 500 landmines per kilometre, according to the Halo Trust, which did the Mukumbura demining project.⁴⁵ Since independence, in 1980, more than 1 500 people and 120 000 livestock have been killed in landmine accidents⁴⁶. In Gonarezhou National Park, a 53 kilometre stretch of landmine field, 300 people have lost their lives in that area alone since 1980. More than 400 cattle and over 500 wild animals have also been killed by mines⁴⁷. Previous attempts to formalise artisanal small-scale mining ignored the concrete needs of women and thus did not effectively improve the status of women⁴⁸. This gender blindness persists in the prevailing illegality policy which perpetuates structural inequalities, worsening the women's situation as they are forced upon arrest to negotiate for 'lighter' charges outside the law to cater for the family care roles they play⁴⁹.

4.5 Green growth fisheries and aquaculture

Conventional fisheries and aquaculture production methods exploit renewable natural resources with a substantial potential for environmental degradation if the industries production practices are not sustainable a feature that are uncommon (Pualy et al. 2003). The industries are important users of energy with significant carbon footprint (Acshe, 2011). As far back as possible Tyedmers et al., (2005) estimate that the world's fishing fleets are using 1.2% of the global oil consumption, primarily as fuel, and by a rough estimate this number will increase to 2% if aquaculture is included. Green growth initiatives in the fisheries and aquaculture sector include harvesting, growing and trading with efficient and sustainable use of natural resources, ensuring that economic benefits from fisheries and aquaculture are equitably distributed and socially beneficial and reducing the carbon footprint of the fishery and aquaculture sectors (including production, processing and trade) and pursuing opportunities to use coastal and marine ecosystems as carbon sinks (UNEP, 2012). Aquaculture Zimbabwe is partnering with established fish farmers, donor agencies, international agencies and government departments to help subsistence farmers in Zimbabwe to diversify crop and livestock production with climate sensitive methods and using locally available inputs and feeds. Women are the majority of subsistence farmers in Zimbabwe; hence the initiative is expected to benefit more women.

5. General equilibrium dashboard model with OECD indicators and the case for just transition and decent work

While green growth involves economic, environmental and social contributions, the current focus of green pathways (discussed in section 4) is economic and environmental efficiency at the expense of social contributions in particular, the decent work agenda. As shall be illustrated in this section, there are key transition uncertainties and decent work deficits. The 11 general equilibrium dashboard transition indicators scored against the green pathways transition evidence (illustrated in section 4) show that labour markets are very certain (VC) about the green pathway sectors, products/services, production methods, green awareness and land and water management issues. However, rural labour

⁴⁰ Economic Forum. Retrieved from World Economic Forum Gender Gap Index Report (2011) http://www3.weforum.org/docs/WEF_GenderGap_Report_2011.pdf.

⁴¹ Newsday Article on Artisanal Mining Must Be Regulated (2014) Retrieved from <https://www.newsday.co.zw/2014/10/14/artisanal-mining-must-regularised/>.

⁴² <http://web.mit.edu/12.000/www/m2016/finalwebsite/solutions/greenmining.html>.

⁴³ <http://web.mit.edu/12.000/www/m2016/finalwebsite/solutions/greenmining.html>.

⁴⁴ Ibid.

⁴⁵ <https://www.newsday.co.zw/2016/02/11/prioritise-awareness-on-demining/>.

⁴⁶ <https://www.newsday.co.zw/2016/02/11/prioritise-awareness-on-demining/>.

⁴⁷ <http://www.herald.co.zw/zimac-needs-47m-for-de-mining/>.

⁴⁸ http://www.zela.org/index.php/latest-news/46-engendering-policy-in-the-artisanal-and-small-scale-mining-sector-in-zimbabwe#_ftn2.

⁴⁹ http://www.zela.org/index.php/latest-news/46-engendering-policy-in-the-artisanal-and-small-scale-mining-sector-in-zimbabwe#_ftn2.

markets are also very uncertain (VU) about the green pathways position in the value chain, occupational profiles, required skills and abilities and job decency. Labour markets are also certain (C) about the development of clean sources of energy, pollution management group, resource management group and green technology and management group pathways (See Table 6).

Table 6: General Equilibrium Dashboard Transition Gaps

General Equilibrium and OECD Indicator	OA/Clean Sources of energy and recycling/Green growth fisheries and aquaculture/Reforestation/Eco-Tourism
Sector	VC
Product/Service	VC
Production Method	VC
Green Awareness	VC
Position in the value chain	VU
Occupational Profile ⁵⁰	VU
Required skills and abilities ⁵¹	VU
Job decency ⁵²	VU
Development of clean sources of energy	C
Green Workload ⁵³	VU
Land and water management	VC
Pollution management group	C
Resource management group	C
Green technology and management group	C

VC=Very Certain C=Certain U=Uncertain VU=Very Uncertain

Evidence from Table 6 supports that green activities have significant job creation potential (OECD, 2011) and can be the new engine of growth (UNEP, 2011). However, there is much that still needs to be understood and investments in research and development will inform key stakeholders on how to transition smoothly. There is still reasonable uncertainty that all jobs generated will be decent and will eliminate persistent poverty. Current knowledge and practices are developed in the context of labour requirements for production and not from the perspective of working conditions and decent work for instance, employment opportunities expected in agriculture, fisheries, forestry, artisanal mining and tourism are clearly outlined. Missing from the green pathways are decent work indicators for instance how the work will lead to adequate earnings and productive work, decent work time, combining work and family life, work that should be abolished, stability and security of work, equal opportunity and treatment in employment, safe work environment, social security, safe work environment, social security, social dialogue, workers and employment representation, economic and social context of decent.

While human resource procedures in the formal sector seeking gender equity clearly articulate most decent work indicators in employment search, recruitment, training, equitable pay and getting organised, activities in resource based sectors remain informal and are currently not integrated in rural policies for the creation of green jobs. Yet conventional rural sector practices exhibit decent work deficits for instance, family labour mentioned as a resilience factor to the extent that it involves child labour is not consistent with the values of decent work. New skills required in renewable energy, conservation and other climate-sensitive tasks may require long hours of training for women away from their families and might also require them to pay. In mining for instance, green technology and equipment require technical know-how which most informal miners especially women currently do not possess. Lack of rules and laws to protect workers in informal employment exposes them to decent work deficits including loss of property and jobs during crisis contexts (Muza, 2009) and also in the process of change from old to new jobs.

Green policies also based on such conventional rural sector practices miss out key elements of decent work and in such instances 'potential is overestimated and environmental policies may have much less attractive labour market consequences' (Morris et al., 2009). In this case, 'job creation has

⁵⁰ Refers to the nature or purpose of the job, irrespective of the sector it is performed in. Almost any occupation can be considered green as long as it contributes to reducing harmful impacts of human activity on the environment either directly/indirectly. As a result, occupations ranging from managers, workers to labourers can all at some point be considered as being green.

⁵¹ Certain jobs require worker to possess certain specialized green skills and abilities. Determining whether a job can be considered as being green can in some cases be done based on the necessary skills and competencies required to perform it.

⁵² The UNEP and ILO have both stressed the fact that green jobs which offer adequate wages, safe working conditions, job security, reasonable career prospects and workers (UNEP 2006, p.4). The Apollo Alliance has also taken up this dimension in its definition of green job stating that 'if a job improves the environment; but doesn't provide a family-supporting wage or a career ladder to move low-income workers into high-skilled occupations, it is not a green collar job'. Job decency is therefore a key dimension of green jobs.

⁵³ Some workers may do some of their work in green areas and some of their work in traditional areas (Connection Research, 2009.p. 17). In this case, it is important to adequately measure the part of the workload that is officially dedicated to green tasks in order to determine if the job can be considered as green.

no merit as a basis for judging decency' (Hughes, 2011) and policies to promote green jobs maybe 'terribly counterproductive' (Alvarez et al., 2010). Again, it is highly questionable whether a government campaign to spur 'green jobs' would have net economic benefits (Michael & Murps, 2009). In this case, 'green jobs do not automatically constitute decent work, as many are "dirty, dangerous and difficult for instance, employment in industries such as recycling, waste management and biomass energy tend to be precarious and low-paid' (ILO, 2012).

6. Towards a gendered integrated pathway for decent work

The gendered integrated pathway for decent work is based on four pillars of fundamental rights, employment creation, social protection and social dialogue, also acknowledging gender equity in the sense that women constitute the majority of the rural labour force and also have high environmental awareness and are important partners in green transitioning. Equitable access to more and better opportunities in rural areas enable rural women to become effective actors and engines of growth; as well as to produce or acquire the food, water, fuel and social services their families need (Cabrera de González et al., 2009). This pathway follows appropriate labour standards that promote both men and women's interests and operationalises the decent work indicators and the general equilibrium dashboard concerns, gaps and opportunities. It recommends targeted policies that improve the livelihoods of rural women in resource-based economies.

6.1 Green jobs and fundamental rights

As illustrated in the preceding discussion, rural workers in informal labour markets work under difficult and unpredictable conditions and more often, their rights are violated. Because, they are not recognised formal workers and are often not protected by law, the integrated pathway recognises fundamental rights at work including the right to green jobs collective bargaining, eradication of forced or compulsory labour and abolishing of child labour. Existing rural groupings including commodity associations, village groups, farmer field schools or other can be used as vehicles for local organisation to enhance collective bargaining. Different rural groupings from agriculture, fisheries, forestry, tourism and artisanal mining will advocate for green jobs issues through District Councillors or Ward Committees who will then lobby governments and employees for decent work in informal labour markets. The decent work and Just Transition maps can feed into the natural resources strategic plans.

6.2 Green jobs and employment creation.

Employment creation under an gendered integrated pathway addresses key four emerging issues regarding jobs created, jobs substituted, jobs eliminated without direct replacement and worker transformation and redefinition. In all scenarios, worker skills will be revised; though some will be made redundant others will be acquired. However, decent work will only be realised if investments in accompanying green technologies are time and labour saving and thus create more time for women to participate in other productive work and also have quality family life. Gender-sensitive financial programmes and packages that empower women to develop and nurture complementary green spaces relevant for sustainable and productive green employment are introduced.

6.3 Green jobs and social protection

Transitioning to the green economy means new ways of doing work as well as new environments for doing work. To feed to the gendered integrated pathway, green jobs promoted in the rural informal sector are safe and provide security, observe healthy and safety regulations, provide sufficient income for a person to live and the work is dignified and offer prospects for personal development. It is linked to some form of social security that provides protection if the worker is unable to work. Because rural sectors are resource-based and sensitive to climate change, the green pathways adopted to create green jobs promote safe working conditions for women and their children. Green playing spaces may be provided for young children to enable women to carry out their work productively. The work spaces for women could be developed to provide shelter and cover against harsh climate conditions. Health and safety regulation trainings and information can be provided on the job or during other community meetings. Green profitable value chains for women and the requirements for success in such endeavours can be recommended for women in informal markets so that women can earn more and also provide the scope for their personal development.

6.4 Social dialogue

The gendered integrated pathway recognises social dialogue for green transitioning as critical in formalising informal workers concerns and feed into the country's green discourse, policy and practice. Informal workers in resource based rural activities have direct experience working in rural economies. Consultation of rural informal workers and encouraging them to express their concerns contributes to decent work at all levels. Particularly for women, who are the majority and have direct experience in environmental practice. Their views are important in policy formulation.

Environmental advocacy through the relevant ministerial portfolios for instance the Ministry of Labour

and Social Welfare, the Employees Council, the Workers Union the green transition needs of informal workers can be presented for motion. Environmental advocacy through the private sector ensures that new technologies introduced are in line with local needs and expectations and also address gender issues. Environmental Advocacy through international governmental organisations also ensures that funding and humanitarian assistance is channelled for actual community needs and gaps.

Improved rural social dialogue (involving employers, workers and government representatives) that involves greening experts and gender advocates support a more balanced policy and research agenda. Additionally, other approaches to understanding the greening transition gaps that take into account decent work and gender equality issues may be considered. Perhaps a complementary monitoring framework (for example, to complement the decent work indicator framework) may be proposed to meet the gendered integrated pathway for decent work in rural areas concerning green jobs and fundamental rights, employment creation, social protection and social dialogue.

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