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# DIAGNOSTIC STUDY REPORT

**Strengthening CSO Support and Advocacy for Sustainable Production and Use of Organic Fertilizer in The Gambia (SAPOF)**

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# Executive Summary

This diagnostic study, commissioned as part of the "Strengthening CSO Support and Advocacy for Sustainable Production and Use of Organic Fertilizer in The Gambia" (SAPOF) project, aimed to assess the current practices, challenges, and opportunities related to agroecology and organic fertilizer production. The study targeted five key regions in The Gambia: North Bank Region (NBR), Central River Region-North (CRR-North), Central River Region-South (CRR-South), Lower River Region (LRR), and Upper River Region (URR), representing the country's farming communities.

**Objectives**: The primary objective of this study was to evaluate the level of awareness, knowledge, and practice of agroecology and organic fertilizer production. In addition, the study sought to understand the socio-economic impact of these practices on local communities, particularly women and youth, and to identify the gaps in infrastructure, resources, and market access that hinder the widespread adoption of sustainable agricultural practices.

**Methodology**: The study utilized a mixed-methods approach, including both qualitative and quantitative data collection. Key methodologies employed were focus group discussions (FGDs) and household surveys, covering a total of 1,873 participants across the five regions. Data collection tools were tailored to capture insights into knowledge levels, production capacities, and market challenges. A combination of Krejcie and Morgan formula was used to determine the appropriate sample size.

**Key Findings**

1. **Youth and Women Engagement:** Youth and women were found to be actively involved in agroecology and organic fertilizer production, but their engagement was limited by inadequate access to resources such as land, tools, and market opportunities. Women, in particular, face challenges related to poor fencing and lack of market access, which diminish their productivity.

2. **Training Programs and Quality:** While some training programs on compost production and agroecological practices were appreciated, they were often hindered by the lack of follow-up support and insufficient materials to apply the knowledge gained. There is also a lack of inclusive training for persons with disabilities.

3. **Production Challenges:** The major challenges identified include insufficient infrastructure (e.g., compost chambers), lack of tools and equipment, and difficulty in accessing raw materials for fertilizer production. These issues were particularly prevalent in regions such as CRR North and URR, where infrastructure is critically lacking.

4. **Market and Economic Factors:** Market access to organic fertilizers remains a significant barrier. High transportation costs and the distance to markets were cited as obstacles, and local production levels were often too low to meet demand.

5. **Climate Change Impact:** Unpredictable weather patterns and increased pest infestation, exacerbated by climate change, were frequently reported as challenges to agroecology. Many participants had shifted to using local pesticides as a more sustainable alternative to chemical options.

6. **Socio-Economic Impact:** Agroecology presents opportunities for economic empowerment, particularly for women and youth. However, without the necessary support

systems—such as access to modern tools, better market access, and continuous training—these opportunities remain largely untapped.

**Conclusion and Recommendations:** The study concludes that while there is a strong foundation of engagement in agroecology and organic fertilizer production, significant gaps in resources, training, and market access prevent the full realization of these sustainable practices. Recommendations include increasing investments in infrastructure (particularly in CRR North and URR), improving access to tools and raw materials, enhancing market linkages, and providing ongoing support and training, especially for marginalized groups such as women and persons with disabilities.

**Key Policy Implications and Impact:**

- **Economic Empowerment for Women and Youth**: By increasing access to resources and markets, this initiative could significantly boost household incomes for women and youth in rural areas, driving local economic growth.
- **Inclusive Training Programs for PWDs**: Incorporating training programs that are inclusive of persons with disabilities will create a more equitable agricultural sector and open opportunities for a previously marginalized group.
- **Sustainability and Climate Resilience**: By promoting agroecological practices and organic fertilizer use, this project will support environmental sustainability and help communities adapt to climate change, securing long-term food security.

These interventions are critical to transforming The Gambia's agricultural landscape and achieving sustainable development outcomes for marginalized populations.

**Next Steps**: The findings from this study will inform future advocacy efforts and policy recommendations aimed at enhancing the sustainable production and use of organic fertilizers, as well as scaling up agroecological practices in The Gambia. The involvement of donor agencies, government bodies, and civil society organizations is crucial in addressing the identified gaps and supporting the transition towards sustainable agriculture.

## 1.1 Introduction

This diagnostic study was conducted to satisfy one of the key and clearly outlined activities in the project: **Strengthening CSO Support and Advocacy for Sustainable Production and Use of Organic Fertilizer in The Gambia (SAPOF).**

Food production addresses one of the most fundamental human needs and has evolved in tandem with humanity to ensure consistent provision, food safety and variety, and improved nutritional composition [1–3]. Currently, food production meets a basic need as well as a variety of social, cultural, and even aesthetic needs and desires[3]. However, with the need to feed seven billion people, food production has a significant environmental cost[4,5]. Farming practices have depleted the Earth's resources and contributed significantly to greenhouse gas emissions, low soil fertility and biodiversity loss, water scarcity, and the release of large amounts of nutrients and other pollutants that degrade ecosystem quality[6]. If nothing changes in the way we produce and consume food, and given the need to increase food production by more than 60% by 2050[7,8], the environmental impacts of food production systems will worsen and increase across planetary boundaries[3]. Improving food production and consumption systems is central to all discussions about sustainable development, from both environmental and socioeconomic perspectives.

From a historical perspective, the Green Revolution has significantly increased global agricultural production, but at the expense of environmental and natural resource degradation[9–11]. Food production was restricted in many regions due to factors such as a lack of land, water, and access to capital[9]. Furthermore, studies show that, in general, technology bypasses the poor, who are unable to benefit from agricultural technologies due to poor land governance, difficulty obtaining inputs and credits, barriers that limit their access to the market and its opportunities, and unfavorable policies such as subsidies that discriminate against them[6,9,12]. Numerous studies suggest that small-scale farmers in developing countries play an important role in food security[13,14], although they account for the vast majority of food-insecure people worldwide[9].

Climate change and variability have had and will continue to have a significant economic impact in the Gambia. More than 98 percent of agricultural lands are rain-fed, making the agriculture sector extremely vulnerable to rainfall fluctuations. The yields of major crops fluctuate by up to 100% per year [15]. The productivity of these crops has decreased dramatically due to a lack of improved technology, declining soil fertility, and climate variability [16]. Crop productivity, such as maize, groundnut, and millet, is expected to suffer as the amount and distribution of rainfall decreases due to rising temperatures [16]. The Gambia's low-lying topography, combined with an overreliance on subsistence rainfed agriculture, inadequate drainage and storm management systems, and a high demand for rural-urban migration, has made it one of the most vulnerable countries to climate change. This vulnerability stems from widespread poverty and a lack of adaptive capacity to withstand the effects of such changes. Limited access to resources to cope with changing lifestyles, particularly during food supplies, and limited access to risk-spreading mechanisms make many households highly vulnerable to the vagaries of current and future climate change [17].

Environmental issues have also featured in The Gambia's Agriculture and Natural Resources (ANR) policies, starting with the (ANR) Policy (2009–2015), which identified the environment as one of the cross-cutting issues [18]. For this reason, the ANR Policy (2009 - 2015) identified a number of environmental policy objectives, including increasing nationwide awareness about environmental degradation, mainstreaming environmental considerations in the planning and implementation of all activities in the ANR sector, enforcing policies, guidelines, and legislation to ensure sustainable environmental management, and protecting the environment from agricultural and related land-use[18]. In the same vein, the ANR Policy (2017 – 2026) includes a number of environment-related policies such as mainstreaming climate change issues in policies, programs, and projects, creation of local conventions on NRM, and ensuring judicious and proper use of agricultural chemicals (fertilizers and pesticides)[18] Thus, Strengthening CSO Support and Advocacy for Sustainable Production and Use of Organic Fertilizer in The Gambia (SAPOF), is apt as one form of climate action as it relates to agroecological activity of the Gambian farmer who is encourage to engage in the production and use of organic fertilizers.

Small farms are estimated to feed roughly half of the world's hungry people[19]. To combat global food insecurity, it is imperative to prioritize the needs of small-scale farmers in developing countries[9]. Many developing countries, particularly those in Africa, face a slew of issues that must be addressed to improve the sustainability of food production. To address all of these issues, many researchers have identified low-external input sustainable agriculture as a preferred development strategy for the problem of food security[9]. Integrated farming, agroecological practices, pest management, and, in particular, organic farming are the most important sustainable agriculture systems introduced in recent years[9].

Nonetheless, organic farming may vary by region. Many researchers, including [1,13,14,20] have proposed organic farming as an environmentally friendly agricultural production system. Organic farming (using organic fertilizer) is thus a holistic production system that takes into account long-term environmental sustainability and primarily aims to produce food in an environmentally friendly manner[1,20–22]. Organic fertilizer provides environmental benefits such as biodiversity conservation, improved soil quality, reduced evaporation and water harvesting, strengthened adaptation strategies, reduced greenhouse gas emissions, and increased energy efficiency. Using organic fertilizer aligns with the goals of environmentally friendly production, improving animal health and welfare, and promoting high-quality products[9]. The International Federation of Organic Agriculture Movements (IFOAM) defines organic farming as being based on four basic principles: health, ecology, fairness, and care for people and ecosystems.

There is compelling evidence to support the claim that organic farming can contribute to food security[14], particularly in certain regions such as Africa. On the other hand, in developing countries where the majority of farmers are small-scale, the conventional agricultural system fails to meet the basic needs of resource-poor farmers[9]. This is due to their inability to afford costly synthetic inputs, demonstrating how poverty and food insecurity frequently coexist[9]. As about three-fourths (70%) of the poor in the world are living in sub-Saharan Africa and Asia, investing in agriculture is an effective strategy to improve their livelihood[5,9]

This study is critically important as organic fertilizer production has received much attention in the literature. Organic amendments' impact on crop yield and soil fertility has been studied extensively around the world, and it has been identified as critical for sustainable agroecosystem management[23]. For example, Kwesiga et al. (2020)[24] investigated the effects of repeated

applications of green and farmyard manures on rain-fed rice performance in East African rural floodplain environments and discovered that both amendments resulted in a significant increase in grain yield (18-62%), with a positive residual effect on non-amended rice yield in the third year, as well as increased soil fertility. Thus, there is enough evidence available even though researchers have paid little attention to these systems – to suggest that agroecological technologies promise to contribute to food security on many levels[25]. This is particularly important for The Gambia as an agriculture-based economy. The use of organic manure and compost has been shown to improve the soil organic matter content, water infiltration and retention, and the available water content of soils by 58–86%[26].

Organic fertilizers are materials with specific chemical composition and high nutritional value that can provide sufficient nutrients for plant growth[27,28]. Organic fertilizers were primarily created by composting animal manure, human excrement, or plant matter (such as straw and garden waste) with microorganisms that fermented at high temperatures[29]. Organic fertilizers improve soil structure, provide a variety of plant nutrients, and introduce beneficial microorganisms into the soil. Organic fertilizers are widely used in agriculture due to their benefits for soil structure and crop yield[30]. Thus, providing significance for this study. Organic fertilization practices can increase crop yields and soil quality, and combining organic and inorganic fertilizers was thought to be an effective solution for crop ecosystem sustainability.[31] Organic fertilizers can improve soil structure and fertility while also increasing soil organic carbon and other nutrients[32]. Many studies have shown that applying organic fertilizers to the soil surface can provide a rich food source for microorganisms while significantly increasing microbial community composition and diversity when compared to no application[33].

Furthermore, studies show that organic farming (use of organic fertilizer) can provide farmers with a variety of economic benefits, including cost savings due to lower input costs[9]. They can also increase their income by selling their byproducts, entering organic markets with certified products, and charging higher prices[34,35]. Despite these benefits and opportunities, small-scale farmers still face significant challenges when transitioning to an organic system[13]. First and foremost, organic farm yields are approximately 25% lower than conventional farm yields; however, this difference is highly dependent on context and local characteristics[36].

Some studies also contend that organic farming is not a viable option for smallholder farmers in many regions, including Africa, who are unable to produce adequate amounts of compost and green manures[9]. Farmers typically need about 5 years to see the best return on their investment. Farmers who adopt certified agroecological practices must also deal with risk management issues during the three-year transition period[21]. As previously discussed, small-scale farmers who choose agroecological practices face a variety of opportunities and challenges. This study will examine the opportunities and main challenges of agroecological practices for small-scale farmers in the study area (NBR, CRR-North & South) in the Gambia. Thus, this study is significant for the potential results and recommendations in providing possible and viable solutions for the production and use of organic fertilizer in the Gambia.

## 1.2 Gambia Agroecological Conditions

The Gambia has an agrarian economy, with more than half of the total arable land area (558,000 ha) dedicated to some form of annual agricultural production.[37] The country is divided into three distinct agroecological zones (AEZs): AEZ1, AEZ2, and AEZ3, all of which suffer from widespread land degradation caused by deforestation, desertification, and biodiversity loss. These zones run along the River Gambia, cutting through the administrative regions. These agroecological zones support agricultural crop and livestock production. The following table shows the country's AEZs.

**Table 1**: Broad characteristics of the three agroecological zones in The Gambia

| AEZ | Name | Average Rainfall (mm} | Length of growing period (days) | Vegetation |
|---|---|---|---|---|
| 1. | Sahelian | < 600 | < 79 | Open savannah |
| 2. | Sudano-Sahelian | 600-1100 | 70-139 | Savannah Woodlands |
| 3. | Sudano-Guinean | < 1200 | 140-150 | Woodlands |

Source:[37] Adapted from the Report on consulting services for Gambia agriculture transformation program (2020-2030)

**AEZ 1** is the smallest of the three AEZs, located in the far north of Central River Region (CRR North).[37] [18] The zone consists of the following districts:

1) Upper Saloum,
2) Lower Saloum, and
3) Nianija

The districts have a total land area of approximately 568 km2 and a sparse human population of 43,995 people (2013 Population and Housing Census)[37], who live in a few large settlements. The zone's population density was estimated to be 77 people per square kilometer. The zone's topography is generally flat, with soil types ranging from non-saline colluvial and alluvial (in wetlands and swamps) to sandy loam soils in the uplands. The climate is Sahelian Woodland Savannah, with a short rainy season from July to October and a long dry season from November to June.

The average annual temperature in the zone is 290 degrees Celsius, the average annual rainfall is less than 600 millimeters, and the cropping season lasts less than 79 days.[37] This makes the area prone to drought and water stress. Its vegetation is primarily open savannah, with shrubs and grasses dominating. The zone's forest resources supply domestic energy (fuel wood), timber (poles, posts, and other building materials), utility requirements, and resources for local medicinal treatments and wild fruits. Non-wood forest products also provide honey to the local population, which serves as a source of income and a food reserve, helping to ensure food security, particularly during the hungry season. The presence of large cattle herds in the zone may also contribute to the overgrazing of the available natural vegetation cover. The majority of the remaining forests in the zone are open forest types, growing on shallow soils with underlying hardpans. The forests that once existed on the deep soils have been lost due to farming encroachment, leaving only a few economically important tree species, such as the bush mango (Cordyla Africana, a food source) and nitrogen-fixing trees.[37]

The farming system commonly practiced in this zone is traditional mixed farming, in which smallholder resource-poor farmers produce crops and livestock side by side. Crop production is primarily carried out on arable land, which is characterized by soils with a low water-holding capacity and thus prone to erosion. Most farm activities are limited to rain-fed agriculture (some farmers use animal traction), and the main food crops grown are cereals (maize, early and late millets, sorghum, and rice); cash crops are groundnut and sesame. Early millet and groundnuts are the most important crops grown in the zone, with low production and productivity owing to the limited use of chemical fertilizers and their high cost, low rainfall of less than 600 mm, and a short growing season of less than 79 days. Crop varieties with a growing period greater than 79 days will not thrive in this agro-ecological zone.[37]

AEZ 2 is classified as Sudano-Sahelian vegetation, with a growing season ranging from 70 to 139 days and a rainfall range of 600 to 1100 mm.[37] The zone's total land area is 418,742 hectares, with a population density of 156/km2 in 2012.[37] AEZ2's landscape is characterized by rolling plateaus interspersed with gallery forest or swampland basins. Except for the extreme north of CRR, the easternmost part of URR South, and the westernmost parts of NBR and WCR, the AEZ 2 encompasses the entire country's agricultural region. Notably, the Central River Region (CRR) and Lower River Region (LRR), which contain extensive areas of swampland, mangroves, rice fields, barren flats, and water surface, account for approximately 79% of the zone's lowland ecosystems.[37] "The rice ecologies are threatened by salinization caused by shortfalls in rain, resulting in salt-water intrusion upstream into the river and its tributaries, as well as by the emergence of potential acid sulphate soils."[37] (p.28)

In contrast, the uplands have sandy-loam to silt-clay-loam soils that are low in nutrients.Upland soils, particularly in the NBR, LRR, and CRR, are typically less than one metre deep and consist of a layer of lateritic hardpans. Furthermore, the high sand content of these soils, combined with their shallowness, makes them highly susceptible to erosion and leaching. Although soils in WCR are typically deeper than those in other parts of the zones, they are still fragile and vulnerable to erosion and nutrient depletion. The vegetation is fairly open. Forest with scattered trees (usually under 15 meters tall), grasslands, and farmlands. Common trees belong to the *combretaceae* family and exist in this zone, indicating the presence of impoverished soils caused by the destruction of the original valuable vegetation cover or soil shallowness.[37] Parts of AEZ 2 in the West Coast Region (WCR) and Lower River Region (LRR) are characterized by the presence of tall Andropogon grass, while the remainder is covered in Meriscus grass. The abundance of grass in the zone makes it vulnerable to frequent severe fires, which have a negative impact on the soils and woody vegetation cover.

**AEZ 3** is in the Sudano-Guinean Zone and has an agricultural population of 163,727 (out of a total population of 587,393), making it less agrarian than AEZ 2.[37] The zone falls within the 900 to 1200 mm rainfall isohyets, has a 140-150 day growing season, and receives roughly 80% of its total rainfall between late July and early to mid-September.[37] Maximum daily temperatures range from 280 to 290 degrees Celsius. It takes up the entire West Coast Region, including much of the western third of the country and the southeastern portion of the Upper River Region. Its topography is distinguished by relatively rich and dense vegetation (now less densely vegetated) comprising more than 50 tree species.[37]

The soil texture in this zone varies from clay to clay-loam, loam, and sandy loam. Soils along riverbanks become hardpan, friable, and tillable in moist lowland ecosystems, and sandy and poorly structured in upper plateau areas. Nonetheless, some lowland ecosystems that experience extreme weather conditions during the long dry season cause increased salinization of the River Gambia in its lower reaches, west of Carrol's Wharf and beyond, up to Tankular in the Kiang district.[37] The vegetation is savannah woodland, which is gradually turning into woodland in some areas, with *Acacia spp*., *Cordia spp*., and oil palm trees dotting the lowland ecologies, where rice cultivation is predominant.[37] The zone resembles humid tropical forest vegetation in parts of the Lower Nuimi and Kombo South Districts. Horticulture production (fruits and vegetables) is popular in this region due to its favorable climate. Horticultural production has the highest potential for providing additional food sources, on-farm income, and export earnings in the zone.[37]

The main upland crops grown in this agro-ecology are early millet, groundnut, rain-fed upland and lowland rice, maize, vegetables, cowpea, cassava, sesame, and fruit trees (mango, citrus, etc.). This zone is most important for horticultural production, which includes small-scale backyard and private gardens, medium to large commercial farms, and communal village garden projects. These crops are grown in smallholder plots on an individual basis. Women grow mixed vegetables in small plots near underground water sources that can be tapped for vegetable irrigation.[37]

## 1.3 Opportunities

### 1.3.1 Environmental benefits

Many studies suggest that the rural poor are among the most vulnerable groups to environmental degradation because many of them live in fragile ecosystems and rely heavily on natural resources for their livelihoods5,9. Any environmental degradation can significantly reduce their income, leading to further depletion of natural resources and trapping them in a cycle of poverty and environmental deterioration9. According to IFOAM, the ecological principles of organic farming result in an organic production system based on natural ecological processes and cycles. Organic farming is thus a comprehensive approach to agriculture that takes into account long-term environmental sustainability and primarily seeks to produce food in an environmentally friendly manner[36]. Organic farming benefits the environment by protecting biodiversity, improving soil, water, and air quality, and increasing energy efficiency[1,20,21]. In general, studies suggest that organic farming has a positive impact on the environment particularly in terms of per unit area9.

### 1.3.2 Economic benefits

The organic industry is one of the fastest-growing sectors of the food market, with a global market worth 72 billion USD in 2013, up from 15.2 billion USD in 19999. The United States and the European Union account for 90% of organic markets while developing countries have very small organic markets[38]. Organic farming is a cost-effective system that, by utilizing local resources, has the potential to contribute specifically to sustainable development in the world's poorest regions and is regarded as a poverty-reduction method, particularly for smallholder and resource-constrained farmers in developing countries9.

Crowder and Reganold (2015)[39] conducted a global meta-analysis of the economic competitiveness of organic farming in five continents and found that, despite lower yields, organic

farming has significantly higher economic profitability (22-35%) than others. According to their findings, organic farming's profitability stems from the higher prices of organic products[39]. Another study comparing the economic profitability of organic and conventional farming in India found that, while crop productivity decreased by 9.2% due to the 20-40% price premium and 11.7% reduction in production cost, organic farming increased farmers' net profit by 22%[40]. In developing countries, organic farming is responsible for increased profitability due to higher yields, lower costs, and organic product price premiums[41].

### 1.3.3 Health and Nutrition Benefits

Regarding food safety and quality issues in food and agriculture, studies show that organic foods contain fewer chemical residues than non-organic foods (Baker et al., 2002). Furthermore, organic products contain lower concentrations of nitrate (Lairon, 2010; Williams, 2002). It is also worth noting that, by eliminating synthetic inputs in farms, OF reduces farmers' exposure to chemical pesticides (Seufert 2012). According to studies, 99% of pesticide fatalities worldwide occur in developing countries where illiteracy and poverty among rural populations are prevalent, and farmers are typically poor and have little knowledge of chemical pesticide safety protocols (Kesavachandran et al., 2009). According to a study on the nutritional quality of organic foods conducted by the French Agency for Food Safety (AFSSA), organic plant products contain more dry matter, minerals such as Fe and Mg, and anti-oxidant micronutrients9. In addition, organic animal products contain more polyunsaturated fatty acids than conventional products[42]. Furthermore, a recent meta-analysis of 343 studies revealed significant nutritional differences between organic and conventional foods9. Organic foods have higher antioxidant concentrations and lower levels of toxic heavy metals such as cadmium and pesticide residues[43].



## 1.4 Challenges

### 1.4.1 Low yield

Researchers argue that low agricultural production in developing countries is primarily due to a lack of access to adequate chemical fertilizers, as well as insufficient crop and water protection technologies9. Thus, if a new agricultural production system is to improve agricultural crop yields, it must address these three issues[44]. Although lower yield in organic farming is a contentious issue, there is a significant body of literature on the subject [9]. A comparative study of organic and conventional systems based on 362 published analyses found that organic farming yields are approximately 80% of conventional yields9.

Furthermore, according to a comprehensive meta-analysis of 66 studies conducted by Seufert et al. (2012)[36], organic production yields were 25% less than conventional systems. This study also discovered that organic farming performance decreased by 43% and 20% in developing and developed countries, respectively[36]. Similarly, Kirchmann et al. (2008)[45] state that scientific studies show that yields from organic systems around the world are 25 to 50 percent lower than conventional systems. They also believe that the amount of available animal manure is critical in this regard. Although many food policymakers and scientists believe that total food production in organic farming could be sufficient to feed the world's population[46], low yield in organic farming is one of the most critical issues concerning organic farming's ability to improve food security [9].

According to 436 studies, lower yield in organic farming is a contentious issue. While some studies suggest that organic farming systems produce more than conventional systems[47], others suggest that they produce less[36,45]. It is also worth noting that the yield difference between organic and conventional farming is highly dependent on region and crop[36].

### 1.4.2 Nutrient management

The health of the soil is strongly linked to crop growth. In general, soil management methods based on agroecological principles increase plant resistance to pests and disease13. On the other hand, nutrient-deficient soils result in low yields, which may exacerbate hunger and poverty[45]. Thus, good soil is critical to farm productivity. Because using synthetic materials is not practised on organic farms, it is critical to maintaining a balance of nutrient output and input. Badgley et al. (2007)[48] believe that leguminous cover crops have the potential to provide enough nitrogen for this purpose, while others disagree. Critics argue that organic nutrient supplies are limited in many parts of the world and cannot be used to replace chemical fertilizers[9].

The production of organic nutrients necessitates additional resources such as land, labour, nutrients, and water, all of which are scarce in many countries. Crop rotation is the most important technique for keeping soil fertile in organic systems[49]. However, this method has some limitations, as cover crops cannot be used to replace nitrogen fertilizer[50]. For example, maize is Africa's primary source of calories, and maize has a high nitrogen uptake. According to studies, small-scale farmers in East Africa who raise livestock can only recover about 7% of the nitrogen excreted in their soil9.

The average amount of livestock manure in Africa is usually insufficient to provide the soil with the necessary nitrogen for maize9. Although legumes have the potential to provide enough nitrogen in the soil, there are some limitations to their use9. This method requires not only a few years to achieve its objectives but also mineral phosphorus inputs. It is worth noting that the most significant limiting factor is the availability of adequate nitrogen during farming seasons.

### 1.4.3 Education and Research

Given that organic farming is a knowledge-intensive rather than input-intensive system (Giovannucci, (2006)[51], knowledge and capacity building are critical components of this system9. Although organic farming encourages the use of indigenous knowledge, however, many believe that small-scale farmers in developing countries can learn organic farming more easily because it is so similar to their traditional knowledge, but farmers must still be educated specifically, about appropriate agroecological practices, the certification process, and critical marketing information[9].

Regarding research, it should be noted that not only is there less organic farming research globally than there is for conventional systems[52], but the majority of researchers have also conducted their studies primarily in developed countries rather than developing countries[36]. Furthermore, small-holders are frequently overlooked in research and extension policies and programs, whereas small-scale farmers require targeted research and investments to improve their situation9. Thus, making this study invaluable for the understanding, acceptability, and sustainability of organic fertilizer production and use in the Gambia. For example, investing in agroecological research can result in a gradual increase in organic yield through breeding or crop rotation and multi-cropping[52], thereby increasing overall yield.

Hence, given the dynamics, growth trajectory, opportunities, and challenges of agroecological practices, this study aims to conduct a diagnostic study to investigate the current practices of the smallholder farmers in the Gambia, particularly in NBR, CRR North and South regions. Furthermore, this study aims to identify areas of improvement and mitigation of challenges for agroecological practices in NBR and CRR-North and South, and by default the Gambia as a whole.

Thus, challenges of crop yield are salient and require thoughtful intervention. Studies have shown the amount of available animal manure is critical concerning crop yields. Although many food policymakers and scientists believe that total food production in organic farming could be sufficient to feed the world's population[46], low yield in organic farming is one of the most critical issues concerning organic farming's ability to improve food security [9]. However, lower yield in organic farming is a contentious issue. "While some studies suggest that organic farming systems produce more than conventional systems[47], others suggest that they produce less[36,45]. It is also worth noting that the yield difference between organic and conventional farming is highly dependent on region and crop[36]." Thus, efforts in the production and use of organic fertilizers should be given due consideration in the Gambia to verify which crops in our agroecosystem may respond positively with increased crop yields.

Challenges of nutrient management require intervention actions that will improve the health of the soil for improved crop growth. Because soil management methods based on agroecological principles increase plant resistance to pests and disease[13], more efforts should be made for better soil management to improve nutrient-deficient soils and avert low yields. Remedying this challenge requires less or no use of synthetic materials and more use of organic fertilizers, Badgley et al. (2007)[48] believe that leguminous cover crops have the potential to provide enough nitrogen. Therefore, the Gambian farmer should be encouraged to plant more legumes and cover crops to improve soil nutrient content.

Organic farming is a knowledge-intensive rather than input-intensive system; knowledge and capacity building are critical components of this system. Although organic farming encourages the use of Indigenous knowledge, many believe that small-scale farmers in developing countries can learn organic farming more easily because it is so similar to their traditional knowledge; however, farmers must still be specifically educated about appropriate agroecological practices, the certification process, and critical marketing information. Thus, this challenge can be addressed with more education/training and information for the proper production and use of organic fertilizers. The education and training on agroecology and the production and use of organic fertilizers should be informed by more research and development efforts by the Ministry of Agriculture and other entities with similar interests.

## 2.0 Definition

Agroecology: In this study, agroecology is defined as agroecology is the integration of research, education, action, and change that brings sustainability to all parts of the food system: ecological, economic, and social.

Organic fertilizer: In this study, organic fertilizer is defined as materials primarily created by composting animal manure, or plant matter (such as straw and garden waste) with microorganisms

that fermented at high temperatures with a specific chemical composition and high nutritional value that can provide sufficient nutrients for plant growth.

## 3.1 Study Objectives

The overall objection of the project is to strengthen the capacities of Civil Society Organizations (CSOs) in The Gambia to engage in policy dialogue at the national and regional levels, as well as in dialogue, implementation, and monitoring of the European Union (EU) and national development plans and programs.

The specific objectives of the project are to strengthen the research, promotion, production, marketing, vulgarization/extension, and the use of organic fertilizers in the Gambia and to promote the consumption of diversified food items produced using organic fertilizers. Thus, the study is significant for agroecology knowledge, and the use production and use of organic fertilizer.

The present Diagnostic study measured or assessed the specific challenges by using mixed method metrics measurement tools (questionnaires) such as content content-specific reliable questionnaires (see Appendix). Furthermore, interviews and Focus Group Discussions (FDG) (qualitative) were utilized to investigate and evaluate the challenges and opportunities in the production, adoption, and use of organic fertilizer. This is furthermore explained in section (5.1).

## 4.1 Study Area

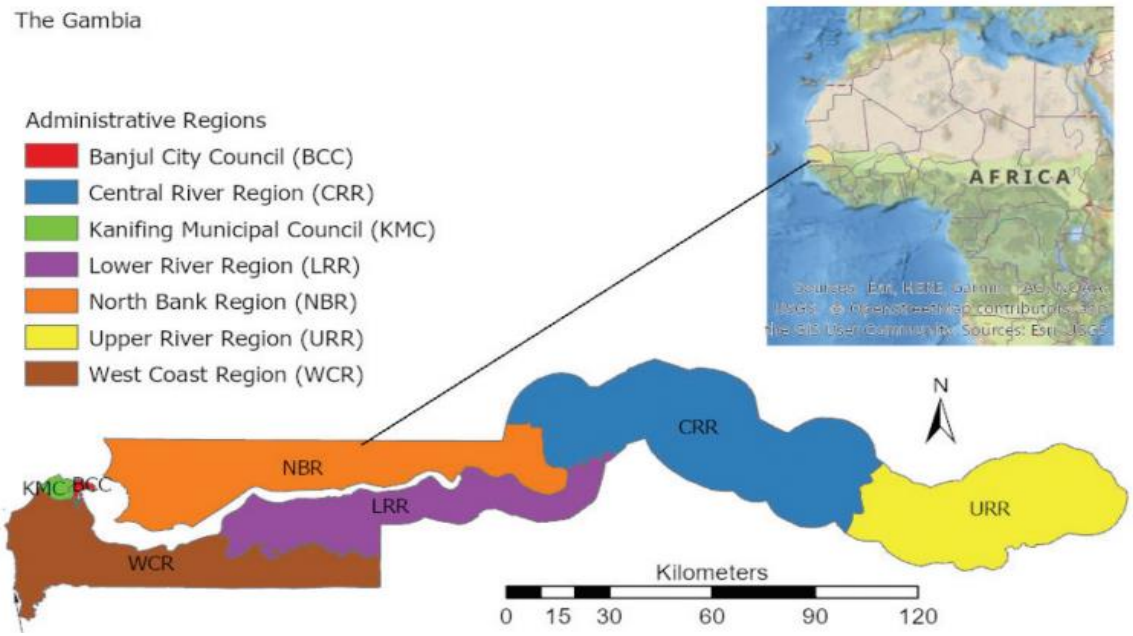



*Figure 1* Source: Dampha (2021) [53]

As a low-income developing country, The Gambia has poverty and unemployment rates of more than 45% and 35%, respectively. The national per capita income in 2019 was $778[54]. Access to quality education and primary healthcare remains limited across the country, though it is slightly better in cities[55,56]. According to Beyers and Wackernage (2019)30, The Gambia has a total productive land area of 1.5 million, defined as its biocapacity with an ecological footprint of 2 million, both measured in global hectares (gha) by the Global Footprint Network" (p. 3).

Furthermore, the ecological footprint measures people's demand or dependence on nature/natural capital assets and flows[57]. "A country is declared ecologically deficit when its footprint exceeds its biocapacity" (Dampha, 2021a p. 3). The Gambia was declared ecological bankruptcy in 2002, and as of 2016, the country had an ecological deficit of 547,341gha. In 2016, an average Gambian had a per capita biocapacity of 0.7gha, compared to 4gha in 1961, and an ecological or environmental footprint of 1gha[58]. Agriculture and natural resources provide a living for more than 75% of the population in The Gambia. With an increasing reliance on natural capital for consumption, income generation, and wealth accumulation, the average Gambian ecological footprint will more than double by 2050 (urban dwellers more so than rural settlers) [58]. Similarly, as the population grows, the biocapacity deficit expands exponentially. As a result, The Gambia will continue to be not only an economically indebted developing country but also an ecological debtor (importing biocapacity) from countries with natural capital reserves, known as ecological creditors[58].

The present study areas are limited to The Gambia regions: North Bank Region (NBR) specifically Nuimi and Central River Region (CRR) North and South, Lower Fullado and Upper/Lower Saloum respectively, LRR and URR. The Gambia is the smallest country in mainland Africa, covering approximately 11,000 square kilometres and bordered by Senegal on all sides except the Atlantic coast. Administratively, the country is divided into five regions (West Coast, North Bank, Central River, Lower River, and Upper River) and two municipalities (Banjul and Kanifing)[18]. The Gambia is a low-income West African country where agriculture is practised by two-thirds of the population. Peanuts are the primary export crop, while rice, millet, and sorghum are traditionally grown for food. Over the second half of the twentieth century, The Gambia became increasingly reliant on rice as a dietary staple, but the country's farmers were unable to increase their market share of the burgeoning urban rice demand[59]. Socioeconomically, the regions of The Gambia are not dissimilar. Thus, there are shared geographical and socio-economic characteristics among regions of The Gambia except for the West Coast Region (WCR) which is closer to the Atlantic Ocean and therefore has a different typological weather indicative of coastal regions. Generally, CRR is further east of the Gambia often referred to as rural Gambia.

### 4.1.1 CRR Characteristics

The CRR has a total area of 2,895 km2 and comprises 10 districts with an average density of 55 persons/Km2. The region is strategically divided into two areas by the river Gambia. The northern part of the region which has five districts is often differentiated from the southern part which also has five districts[60]. The northern part is referred to as the Kuntaur local government area and the southern part as the Janjanbureh local government area. However, Janjanbureh is the regional capital. The Kuntaur local government area has 5 districts with densities ranging from 32 persons/Km2 to 90 persons/Km2 with an average density of 47 persons/Km2. On the other hand, Janjanbureh districts have 32 persons/Km2 to 240 persons/Km2 with an average density of 61 persons/Km2.

**Map of the Central Region Region (CRR)**

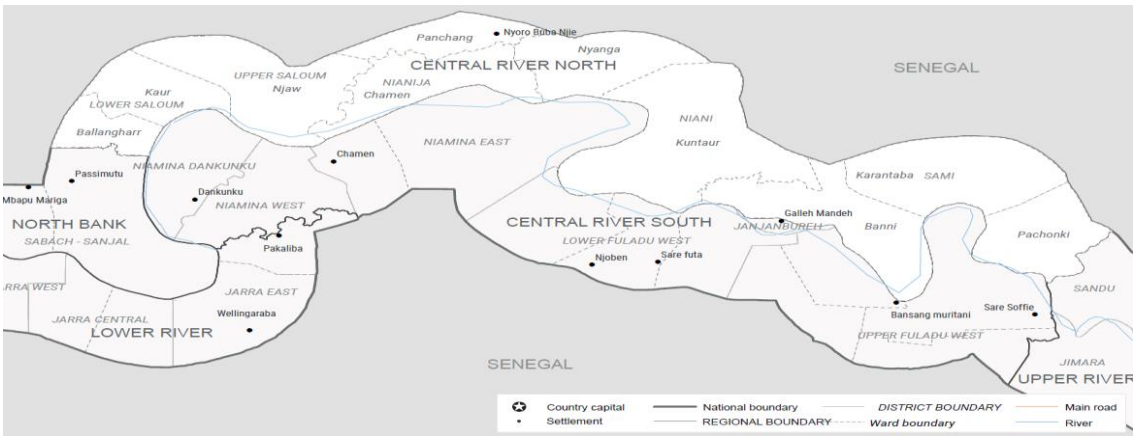



*Figure 2 Source:* [61]

The CRR is made up of ten local administrative districts, each headed by a District Chief named Seyfo. According to the 2013 census, The Gambia's Central River Region has 226,018 inhabitants (Gambia Bureau of Statistics (Gbos), 2013). The area has good soil structure and fertility, as well as some vegetative cover when compared to the rest of the country, particularly in the north [63]. Almost all CRR residents rely on agriculture, either directly or indirectly, and poor or failed harvests pose a serious threat to the region's food security. Because of region has approximately 105 horticultural marketing federations, the region was chosen as the subject of this study. See Table 1 for the distribution of households by district in CRR-North and South.

## Table 1: CRR- South DISTRICT-NUMBER OF HOUSEHOLD DISTRIBUTION

| CRR-South (Janjanbureh) | District | Household No. | Percent (%) |
|---|---|---|---|
| 1 | Niamina Dankunku | 894 | 6.0 |
| 2 | Niamina West | 758 | 5.0 |
| 3 | Niamina East | 2521 | 17.0 |
| 4 | Lower Fuladu West | 3714 | 26.0 |
| 5 | Upper Fuladu West | 5925 | 41.0 |
| 6 | Janjanbureh | 653 | 5.0 |
| **TOTAL** | | **14465** | **100** |

**CRR-North**

| CRR-North (Kuntaur) | District | Household No. | Percent (%) |
|---|---|---|---|
| 1 | Lower Saloum | 1935 | 18.0 |
| 2 | Upper Saloum | 2006 | 18.0 |
| 3 | Nianija | 1121 | 11.0 |
| 4 | Niani | 3337 | 30.0 |
| 5 | Sami | 2564 | 23.0 |

| | | |
|---|---|---|
| **TOTAL** | **10963** | **100** |

Source: [64]

### 4.1.2 NBR Characteristics

Similarly, the North Bank Region (NBR) is in the north of the Gambia. NBR is one of the five administrative areas of the Gambia. The regional headquarters of North Bank is located in Kerewan with a population of 2,751 people. It was subsequently reorganized as the Kerewan Local Government Area, without any change in the area covered. Per the 2013 census, the region had a population of 221,054 with a population density of 98 inh./km². The NBR region covers a total area of 2,225 km2 and has six districts. The districts have densities ranging from 49 to 93 people per square kilometre. The North Bank region accounts for 15% of the Gambia's population, and its population growth from 1983 to 1993 was 37.53%, making it the third fastest-growing region after the Kombo St. Mary's and the WCR[60]. According to migration statistics, the NBR accounted for the largest number of people (25,000) who moved from Gambian locations. 8%-64% of these migrants settled in Banjul and Kombo, respectively.

**Map of the North Bank Regions (NBR)**

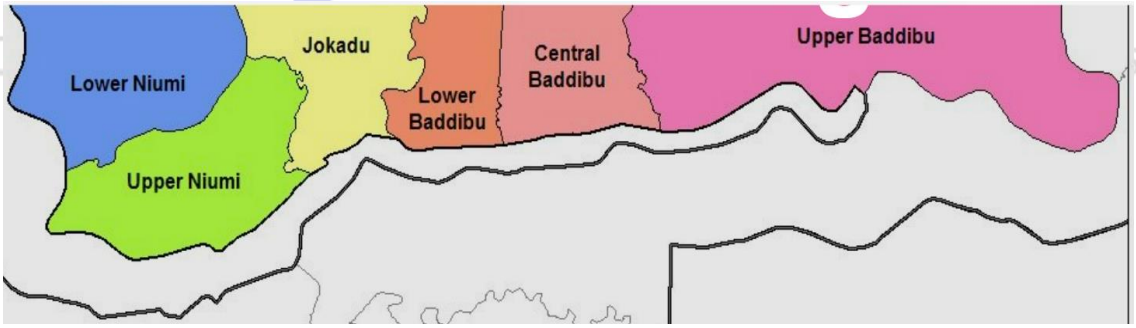



*Figure 3 Source:* [65]

According to Yaffa (2013)[66], "The North Bank Region, the region of The Gambia is most vulnerable to drought due to low rainfall and patchy distribution of rainfall. The region also has less vegetative cover compared to the rest of the country. The North Bank Region is characterized by poor soil structure and fertility. The region has become much more prone to drought in the 20th century……Because of its low vegetative cover, the North Bank Region is highly susceptible to soil erosion during times of heavy rains and windstorms in the dry season. Almost all the population of the region depends directly or indirectly on the agriculture sector. As a result, poor or failed harvests seriously threaten household food security and livelihoods. For example, low crop yields result in higher food prices, which, in turn, affect food availability and the amounts

that households consume" (p.11). See Table 2 for the distribution of households by district in NBR.

## Table 2: NBR- DISTRICT-NUMBER OF HOUSEHOLD DISTRIBUTION

| NBR (Kerewan) | District | Household No. | Percent (%) |
|---|---|---|---|
| 1 | Lower Niumi | 8295 | 30.2 |
| 2 | Upper Niumi | 3929 | 14.4 |
| 3 | Jokadu | 2594 | 9.4 |
| 4 | Lower Badibu | 2236 | 8.1 |
| 5 | Central Badibu | 2280 | 8.3 |
| 6 | Illiasa | 5556 | 20.2 |
| 7 | Sabach Sanjal | 2589 | 9.4 |
| **TOTAL** | | **27479** | **100** |

*Source:*[64]



### 4.1.3 LRR Characteristics

Lower River Division covers 1556 sq. Km with a population of 72,167 is the least populated region in the Gambia. The regional headquarters is Mansakonko. Until the late 1960s when it became its region, the North Bank Region was part of the Lower River Region. With Mansakonko (King's Hill or Government Hill in Mandinka), LRR has 6 districts with Kiang West District being the largest. Like all other regions east of the West Coast Region, the region has suffered from steady out-migration of population to either Banjul, Weste Coast Region and KMC.


*Figure 4. Source* [67]

Jarra Central home to both Mansakonko and Soma, the economic capital of the division is the most populous district. Jarra Central experienced rapid expansion in its population throughout the 1980s and 1990s.[67] The rapid growth was driven in part by its role as one of the hubs on either side of the Bambatenda-Yelitanda crossing along the Trans-Gambia Highway. The Trans-Gambia Highway is the main trunk road linking Cassamance and the rest of Senegal. During the Senegambia Confederation, Jarra Central and the town of Soma in particular have seen a rapid increase in cross-border commerce and trade fueling the rapid influx of people into the area. Eight of the 10 largest settlements in the region are in Jarra Central.

The LRR is a primarily agricultural region with most people engaged in the production of groundnuts, millet and rice. A significant amount of the rice cultivated in the LRD is grown in Jarra where freshwater is abundant. LRR also has a large population of cattle population[67].

One of the oldest European Trading Posts and Missionary, Tancrowall (Tankular), and numerous forts (Tatto in Mandinka) are in LRR. Tankular was one of the oldest Portuguese settlements and missionaries beyond James Island. Although much is not known about the descendants of these people, Tankular in the 1700s was described by European travellers to the Gambia as a "Place of Great resort and richest in the whole of the River"[67].

The largest National Park in the Gambia, the Kiang West National Park is in the Lower River. Established in 1987, the National Park has many rare and endangered wildlife species in the country's including the Nile crocodile, clawless otter, marsh mongoose, Sitatunga, leopards and West African manatees[67]. Over 250 species of bird have been recorded in KWNP including 21 raptors: vultures, harrier eagles, hawks and falcons. See Table 3 for the distribution of households by district in LRR.



**Table 3: LRR- DISTRICT-NUMBER OF HOUSEHOLD DISTRIBUTION**

| LRR (Mansakonko) | District | Household No. | Percent (%) |
|---|---|---|---|
| 1 | Kiang West | 2230 | 18.0 |
| 2 | Kiang Cental | 1148 | 10.0 |
| 3 | Kiang East | 939 | 8.0 |
| 4 | Jarra West | 4162 | 35.0 |
| 5 | Jarra Central | 1290 | 11.0 |
| 6 | Jarra East | 2216 | 18.0 |
| **TOTAL** | | **11984** | **100** |

*Source:*[64]

### 4.1.4 URR Characteristics

Upper River Region, occupying about 2000 sq km is the second largest division in the Gambia[68]. The region has 4 districts, namely Fulladu East, Kantora, Wuli and Sandu with the headquarters in Basse Mansajang Kunda. The largest and most populous district is Fulladu East. Occupying

39% of the total land area of the division, the district is home to 53% of the residents in the Division with a population density of 125 persons per sq. km about the national average. The second most populous district is Wuli, the largest of the two districts on the north bank of the Division, with 19% of the divisional population. Sandu district is the least populated in the Division with a population density of 31 persons per sq. km.

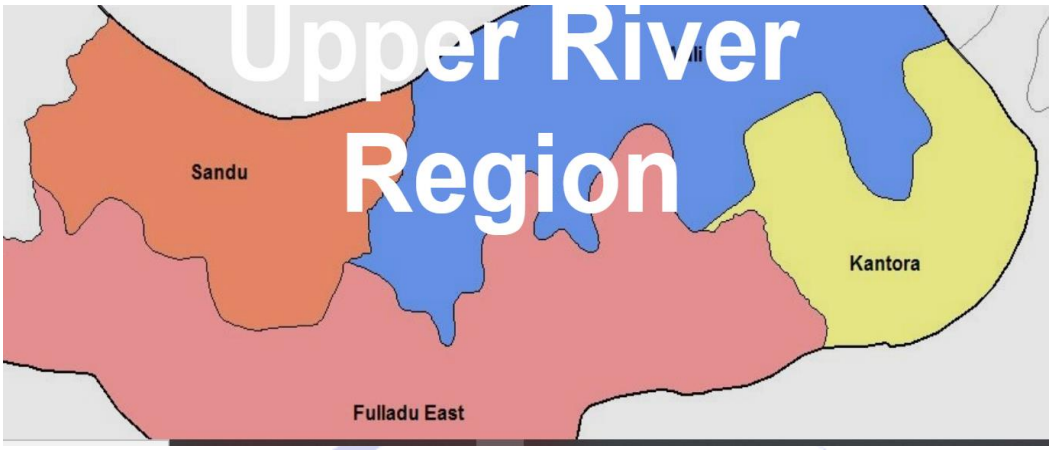



*Figure 5 source*[68]

The population of Upper River Division in 2003 was 182,586 an increase of 18% from 1993. The distribution of population varies across the division with over 70% of the population living in the two south bank districts of Fulladu East and Kantora. Only one of the 10 largest settlements in the division is on the north bank of the river. The largest town Basse is also the commercial center of eastern Gambia. Over the years Basse has become an important transit point for goods going to eastern Senegal, the Republic of Guinea, and Mali[68].

Like the Central River Region, agriculture and livestock are the main livelihood in URD. Fulladu East is a major livestock production centre. Extensive floodplains in the Division have led to the expansion of irrigation rice production in many areas. Groundnuts, millet, and maize are the dominant crops within the upland areas. In efforts to diversify agriculture, successive governments have promoted commercial cotton production although with limited success[68]. See Table 4 for the distribution of households by district in URR.

## Table 4: URR- DISTRICT-NUMBER OF HOUSEHOLD DISTRIBUTION

| URR (Basse) | District | Household No. | Percent (%) |
|---|---|---|---|
| 1 | Jimara | 6267 | 18.0 |
| 2 | Basse | 9867 | 28.0 |
| 3 | Tumana | 5213 | 15.0 |
| 4 | Kantora | 4830 | 14.0 |
| 5 | Wuli West | 2611 | 8.0 |
| 6 | Wuli East | 3011 | 9.0 |
| 7 | Sandu | 2860 | 8.0 |
| **TOTAL** | | **34659** | **100** |

*Source*: [64]

## 5.1 Diagnostic Survey Methodology

### 5.1.1 Study Design:

The present diagnostic study adopted a mixed-methods approach, combining both quantitative and qualitative methods to gather a holistic understanding of agroecology and organic fertilizer practices in The Gambia, and drawing data from horticultural marketing federations in NBR and CRR (North and South). Studies of farming systems with similar objectives to the current study are typological mixed methods analyses to classify prevailing practices among farmers and identify farmer characteristics that determine their proclivity to engage in those sets of practices[69]. Such analyses typically use multivariate statistical approaches with a variety of techniques[70]. The most commonly used techniques in this regard are factor analysis (FA), principal component analysis, and cluster analysis[71]. The usefulness of each of these techniques is situation-dependent. From the literature, we identified a universal set of observable organic fertilizer use decisions to support possible sub-sets of decisions by farmers in the study area. Since there is no prior information about how farmers make organic fertilizer decisions, we could not assume any number or nature of expected factors. Hence, the present study applied exploratory factor analysis on observed decisions/actions of farmers to identify common factors/challenges and opportunities engaging in agroecological and organic fertilizer practices. Thus, based on the objectives of the study, the nature of the study was exploratory. Hence the study adopted an exploratory research design using a micro survey (questionnaire and focus group discussions). The study was conducted in three main phases: preparatory phase (1), data collection phase (2), and data analysis phase.

**Phase 1: Training and Pilot. April 27, 2024**

**Table 5: List of participants in the preparatory training at CepRass**

| No. | Name | Organization | Function |
|---|---|---|---|
| 1 | Fatou Cham | CepRass | Coordinator |
| 2 | Mbye Lowe | CepRass | Data Manager |
| 3 | Dr. Morro Kurubally | CepRass | Facilitator |
| 4 | Dr. Faye Jerreh Manneh | CepRass | Facilitator |
| 5 | Dr. Banna Sawaneh | CepRass | Facilitator |
| 6 | Lamin Dampha | CepRass | Facilitator |
| 7 | Basiru Jallow | North Bank Region | Data Collector |
| 8 | Jainaba Jawo | North Bank Region | Data Collector |
| 9 | Ali Nget | North Bank Region | Data Collector |
| 10 | Nyima Sawaneh | CRR South | Data Collector |
| 11 | Yorro Jawo | CRR South | Data Collector |
| 12 | Mamut Mbaye | CRR South | Data Collector |
| 13 | Dicko Bah | CRR North | Data Collector |
| 14 | Cherno Omar Jallow | CRR North | Data Collector |
| 15 | Bakary Nano Njie | CRR North | Data Collector |
| 16 | Mariama Drammeh | Lower River region | Data Collector |
| 17 | Lamin Jallow | Lower River region | Data Collector |
| 18 | Ebrima Nget | Lower River region | Data Collector |

| | | | |
|---|---|---|---|
| 19 | Yahya Mboge | URR | Data Collector |
| 20 | Dembo Mbye | URR | Data Collector |
| 21 | Ismaila Ceesay | URR | Data Collector |

Source: CepRass (2024)

The names listed in Table 5, participated in a preparatory training for the data collection team for the present diagnostics study. The training lasted for 8 hours during which the training addressed a myriad of issues including but not limited to the following:

1. Introduction to the study (The purpose of the study)
2. Understanding the subject matter of the study
3. Understanding the content of the study
4. Understanding the objectives of the study
5. Understanding the role of the data-collecting team
6. The role and function of CepRass
7. The responsibility of every participant (team member)
8. Understanding the study tools (questionnaires)
9. Conducting content and face validity of the questionnaires
10. Understanding the data collection software and tablets
11. The importance of teamwork
12. The importance of interpersonal skills
13. Appropriate interface with the local people
14. Ethics in data collection
15. Importance of effective communication
16. Time management etc.
17. Quality research functions
18. Quality and factual reporting
19. Thoroughness in all research activities

### 5.1.2 Population

The population of the present diagnostic study represents the households in the respective districts of the 5 rural regions in the Gambia (NBR, CRR-North &South, LRR, and URR); the largely farming communities in the Gambia. Therefore, the study targeted households in the farming communities in the districts of the regions mentioned above. The population (No. of households) for the study consists of 31 districts with 99549 households. See Table 6 for the number of districts and households in the study area.

**Table 6: No. of Households in the Regions of the Gambia (Study Area)**

| No. | Regions | District | No. of Household (Population) |
|---|---|---|---|
| 1 | NBR | 7 | 27479 |
| 2 | CRR-SOUTH | 6 | 14465 |
| 3 | CRR-NORTH | 5 | 10963 |
| 4 | LRR | 6 | 11984 |
| 5 | URR | 7 | 34659 |
| | **TOTAL** | 31 | **99549** |

Source: [64]

### 5.1.3. Sampling

#### 5.1.3.1 Sampling Frame

The sampling for the present research was based on probability sampling. In the probability sampling category, the simple random sampling method is the common method used in most research. In such a case, the opportunity is independent and on an equal basis for every respondent to be chosen as a part of the sample (Sekaran, 2003)[72]. Thus, this diagnostic study was conducted using stratified sampling. According to Cohen et al. (2007)[73], stratified sampling includes the division of the total sample into homogenous groups, where every group has subjects with common characteristics. For instance, category A for males and B for females. To get the sample representative of the total population of both genders, there should be a random selection from both groups A and B. The right proportion of A (males) to B (females) in the total population can be reflected in the sample. Furthermore, such research will have to identify all those qualities and characteristics of a large population that must be included in the sample, i.e. to identify and explore the parameters of the large population[73].

The population of this study was stratified first by regional population, followed by farming districts, followed by farming households, and finally active farmers male or female. The respondents were randomly selected in their respective districts. Stratification of the population was necessary to achieve the aim of study's participant representation. Farming communities are found in all five regions of the Gambia. However, this diagnostice study requires that participants are sourced from specific farming communities. Thus, stratification of the populationby started by: strata (1) indentifying the communities of interest regionally; strata (2) as per scope of the study, regions LRR, CRR-North & South, and URR were selected; strata (3) dentifing farming districts in the selected regions; strata (4) identifing farming households in the community, and lastely strata (5) identified famers (Male and Female) for participation in the study. Furthermore, the difficulty in accessing all rural households of the regions warranted the use of stratified sampling. Therefore, stratified sampling was appropriately used to ensure that the study obtained accurate representaton of Gambian population of which a significant number (approximately 70% of the population earn their living through agricultural engagement). Moreover, samples obtained from stratification of the farming regions were sufficiently representative of the farming households in the specific geographical locations (scope). Moreover, stratified sampling approach was the most appropriate for the present diagnostic study because of the availability of information (list of households in the regions/districts provided by Gambia Bureau of Statistics(GBoS)[64].

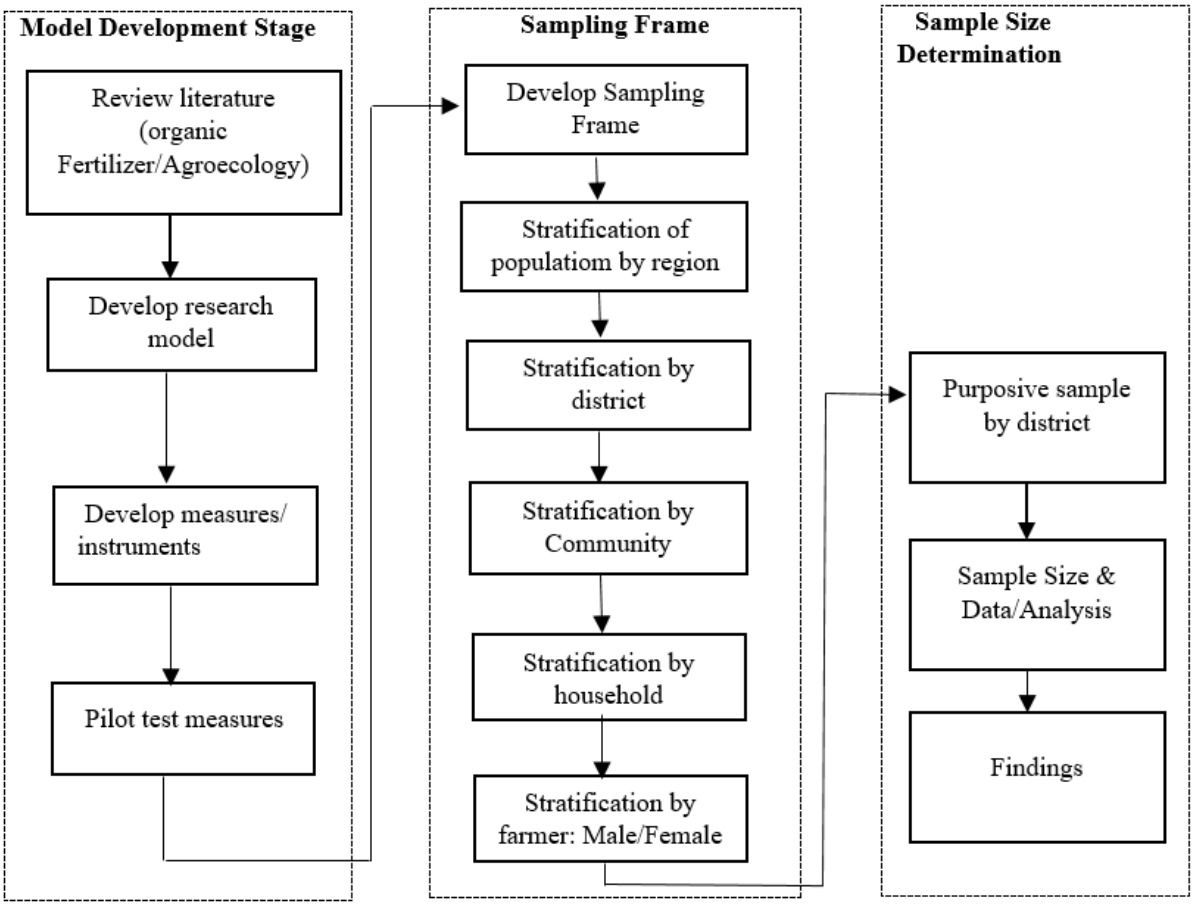





Figure 1: Study Model

The present study was only able to access the list of farming households in the Gambia using GboS data. Thus, the present study determined 50110 farming households (krejcie and Morgan formula to determine the sample size of the study-1713). Questionnaire distribution by district in a region was calculated based on the proportionate-to-size method: (district household size/region household size x sample size). See Tables 6-10 below.

The present study's unique circumstances warranted the use of stratified sampling. Given the characteristics nature of small-scale farmers and the shared geographical locations and practices in the Gambia, the present participants are undoubtedly appropriate representatives of the Gambian farming population. Thus, the selected sample for the present study is appropriate for the general representation of the Gambian farming population and for achieving the objectives of the study.

### 5.1.3.2 Reason for Convenient & simple random Sampling

| NO. | Regions | District | Household No. | Sample Size (Krejcie & Morgan) |
|---|---|---|---|---|
| 1 | NBR | 3 | 14813 | 306 |
| 2 | CRR-South | 3 | 4173 | 351 |
| 3 | CRR-North | 3 | 5062 | 357 |
| 4 | LRR | 3 | 7317 | 382 |
| 5 | URR | 3 | 18745 | 317 |
| **Total** | | **15** | **50110** | **1713** |

Following the initial sampling framework, there arose a need to expand the sampling framework. This resulted in the adoption of the convenient and random sampling method. Convenient sampling and randomly selecting three districts in each region was deemed necessary for determining the number of questionnaires for the selected districts of each region.

Because of a coincidence, this diagnostic study was conducted in the rainy season of August in the Gambia. During this period (August) access to certain identified districts in each region was practically insurmountable. Some of the districts are marred by inaccessible rural roads practically prohibiting access to study participants in some parts of the country; rural Gambia. Convenient sampling was appropriately used in exploratory research such as the present study where the researcher is interested in getting access and inexpensive and less difficulty in collecting data. Thus, three accessible districts were randomly identified and prudently selected for participants of the study: NBR, CRR-North & South, LRR, and URR. See Table 9-13 for the randomly selected districts in each region. Based on the three districts selected in each region, the sample size for the study therefore was determined as follows:



**Table 7: Sample size per region (3 regions selected by region)**

1) **NBR-306**
2) **CRR-Sout-351**
3) **CRR-North-357**
4) **LRR-382**
5) **URR-317**

Based on the random selection of 3 regions in each of the five regions, the total number of districts sampled was determined at 15 districts.

Based on the random selection of 3 regions in each of the five regions, the total number of households (population) of the study was determined at 50110. (See Table 5 below)

### 5.1.3.1 Sample Size

This study resolved to use Krejcie and Morgan formula to determine the sample size for the study. Because this study area cuts across Gambia's farming community in 5 regions with 15 districts

Krejcie and Morgan's formula for the determination of sample size was found appropriate in this scientific research (See Figure 3 for formula). Based on Krejcie and Morgan the sample size for the study was determined at 1713 (See Table 8) (See Appendix A)

## Table 8: Krejcie and Morgan Formula

*Formula for determining sample size*

$$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$$

$s$ = required sample size.

$X^2$ = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

$N$ = the population size.

$P$ = the population proportion (assumed to be .50 since this would provide the maximum sample size).

$d$ = the degree of accuracy expressed as a proportion (.05).

*Source: Krejcie & Morgan, 1970*

*Source:* [74]

## Table 9:NBR- Number of Questionnaires Proportioned to each district

| NBR Districts | No. of Household | Percentage Share (%) | No of Questionnaires |
|---|---|---|---|
| Lower Niumi | 8295 | 0.57 | 174 |
| Upper Niumi | 3929 | 0.26 | 79 |
| Sabach Sanjal | 2589 | 0.17 | 53 |
| Total | **14813** | **100** | **306** |

Author's Computation from GBoS (2024)

## Table 10:LRR- Number of Questionnaires Proportioned to each district

| LRR Districts | No. of Household | Percentage Share (%) | No of Questionnaires |
|---|---|---|---|
| Jarra West | 4162 | 0.57 | 218 |

| | | | |
|---|---|---|---|
| Kiang East | 939 | 0.13 | 50 |
| Jarra East | 2216 | 0.30 | 114 |
| Total | **7317** | **100** | **382** |

Author's Computation from GBoS (2024)

## Table 11: CRR-South Number of Questionnaires Proportioned to each district

| CRR-South Districts | No. of Household | Percentage Share (%) | No of Questionnaires |
|---|---|---|---|
| Niamina Dankunku | 894 | 0.21 | 74 |
| Niamina West | 758 | 0.18 | 63 |
| Niamina East | 2521 | 0.61 | 214 |
| Total | **4173** | **100** | **351** |

Author's Computation from GBoS (2024)

## Table 12: CRR-North Number of Questionnaires Proportioned to each district

| CRR-North Districts | No. of Household | Percentage Share (%) | No of Questionnaires |
|---|---|---|---|
| Lower Saloum | 1935 | 0.38 | 136 |
| Upper Saloum | 2006 | 0.40 | 143 |
| Nianija | 1121 | 0.22 | 78 |
| Total | **5062** | **100** | **357** |

Author's Computation from GBoS (2024)

## Table 13: URR- Number of Questionnaires Proportioned to each district

| URR Districts | No. of Household | Percentage Share (%) | No of Questionnaires |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Jimara | 6267 | 0.33 | 104 |
| Basse | 9867 | 0.53 | 168 |
| Wuli West | 2611 | 0.14 | 45 |
| Total | **18745** | **100** | **317** |

## 6.1 Qualitative Data Collection

### 6.1.1 Stakeholder Identification

In addition to the administration of questionnaires for quantitative data, key stakeholders involved in agroecology and organic fertilizer production, distribution, and utilization were identified for the conduct of focus group discussions (FGDs) using purposive sampling. The stakeholders identified include farmers, agricultural extension workers, government agencies, NGOs, and private sector entities. The following list of stakeholders is identified below but not exhausted.

1. CSOs (Civil Society Organizations)
2. Community Gardeners
3. Community "Kafos" (horticultural groups) in rural and semi-urban Gambia
4. Government agencies and affiliates etc.

The FGD captured qualitative insights relevant to the baseline survey objectives. An FGD guide was developed in consultation with the AAITG EU Project Team. This guide facilitated comprehensive discussions covering all aspects pertinent to the baseline survey objectives, comprising both leading and probe questions to extract insights from stakeholders regarding policy, agroecology, organic fertilizer production and usage, market dynamics, and technological advancements in organic composting, aligning with the focus areas of the baseline survey.

The FGDs were facilitated by moderators, with a dedicated notetaker for each FGD session. Three teams were formed and evenly distributed across the study sites. Each team comprised a moderator (researcher) and a notetaker (enumerator), totaling six (6) qualitative data collectors. Additionally, a qualitative field coordinator was appointed to oversee the qualitative data collection process. The duration of qualitative data collection was 10 days. Before field deployment, a comprehensive two-day training session was conducted to familiarize data collectors with the questionnaire and FGD Guide and train them on their administration. On the final day of training, a pretest of the tools was conducted by each team, with observations incorporated into the final questionnaire. During interviews and discussions, responses were audio-recorded in a language understood by all participants.

## 7.1 Data Analysis

Simple descriptive statistics were deployed. This included central tendency measures (mean, median, mode), and standard deviation, which were used were relevant. Content and thematic analysis were applied in analyzing FGDs. Following data collection, audio recordings were

transcribed and analyzed using content and thematic analysis. The analysis focused on identifying key themes and insights relevant to the research objectives.

## 8.1 Ethical Considerations

Prior informed consent was obtained from all participants before their involvement in the study.

Confidentiality of participants' information was ensured, and data will be anonymized during analysis and reporting. Cultural sensitivities and norms were respected throughout the research process to ensure the dignity and well-being of participants.

## 9.1 Quality Assurance

Enumerators were rigorously trained in data collection techniques, ethical considerations, and the use of data collection tools to ensure consistency and accuracy in data collection. Data collection tools were pilot-tested in a small sample of participants to identify and address any issues or ambiguities before full-scale implementation. Field supervisors provided regular supervision and support to enumerators during data collection to ensure adherence to protocols and quality standards.

# 10. Findings

## 10.1 Regional Comparison Analysis (Quantitative Data)

## A. Demographic Information of The Respondents

### Analysis of Socio-Demographic Characteristics with Contextual Insights

The socio-demographic analysis provides a comprehensive overview of the population involved in the study. This analysis can be instrumental for understanding the dynamics of the sample population in the context of agroecology and organic fertilizer adoption, and how different socio-demographic factors may influence the outcomes in these areas.

### 1. Gender Distribution Context

- Overall Analysis:

The gender distribution shows a slight male predominance (53% male and 47% female). This almost balanced ratio indicates that both genders are adequately represented in the study.

Gender-based roles in agricultural practices, decision-making, and access to resources could impact the adoption and use of agroecology and organic fertilizers. Men's slight predominance might influence the decision-making processes in households regarding these practices.

- Regional Analysis:

Gender distribution is expected to vary by region due to socio-cultural norms. However, with the data provided, the gender ratio seems relatively balanced across regions, which is crucial for targeted interventions and inclusive policy planning.

The data indicates that male dominance (53%) in the agroecology and organic fertilizer production is not as significant as in comparison. However, implicit in this data as it relates to women is that greater focus for intervention actions should be directed at women to increase their participation in agroecological activities and in the production and use of organic fertilizer. This intervention is expected to yield increase involvement of women in agroecological activities by that, creating increased adopting and practices in organic fertilizer production and use by women. This is particularly important as women are usully disadvantaged in most rural societies and bear the greater burden of poverty. Furthermore, women are predominant actors in horticulture. Thus, intervention efforts/initiatives should give greater consideration to women. By increasing the participation of women in agroecological activities and in the production and use of organic fertilizer, will by default result in the increase involvement of the farming communities across the regions; both men and women would find the importance of agroecological activities and the prodution and use of organic fertilizer gainful and reducing their dependence on chemical fertilizer.

## 2. Age Categories Context

- Overall Analysis:

o the age distribution reveals that the largest age group is 45-54 years (30%), followed by those above 54 years (25%), and 35-44 years (23%). The smallest group is the youth category (25-34 years) at 6%.

o This skewed age distribution suggests that the population involved in agriculture (or relevant sectors) is predominantly middle-aged or older. This could indicate potential challenges in adopting new practices such as agroecology, which might require more innovation and labour-intensive approaches that younger people may be more inclined to adopt.

- Regional Analysis:

o Different regions may have different age dynamics impacting agricultural practices. For instance, areas with more middle-aged or older populations, like URR and LRR, may face challenges in labour availability and may have different attitudes toward adopting new agricultural techniques.

o younger populations, although less represented in this data, could be targeted for training and capacity-building programs in agroecology, especially in regions where youth migration rates are lower.

## 3. Educational Status and Level of Education Context

- Overall Analysis:

o with 54% of the population being literate and 46% non-literate, the study population is nearly equally split between literate and non-literate individuals. Educational attainment further shows that 32% have secondary education, while very few (1%) have university-level education.

o Low levels of higher education may impact the adoption of agroecological practices, which often require understanding complex ecological principles and innovative techniques. High levels

of non-formal education (34%) suggest that community-based training and informal education methods could be effective in knowledge dissemination.

- Regional Analysis:

o Regions like CRR South and LRR may have varying levels of educational attainment, which would affect how agricultural extension services are designed and delivered. In regions with higher literacy rates, more advanced training on agroecology could be conducted, whereas regions with lower literacy might require more practical, hands-on approaches.

## 4. Marital Status Context

- Overall Analysis:

o A significant majority (92%) of respondents are married, with only 4% single and even fewer divorced or widowed. This high percentage of married individuals can have significant implications for household decision-making dynamics, resource allocation, and labor distribution in agricultural activities.

o Married individuals might have more stable access to land and resources, which is beneficial for adopting long-term practices like agroecology and organic fertilizer usage. However, this may also mean that women's voices could be marginalized in decision-making processes in male-headed households.

- Regional Analysis:

o Regions like CRR North and South, where traditional norms might be stronger, may see different dynamics in terms of how marital status affects the division of labor and decision-making in agroecology adoption. Areas with more diverse marital status demographics might have different social dynamics influencing agricultural practices.



## 5. Regional Distribution Context

- Overall Analysis:

o the sample is distributed across multiple regions: North Bank Region (NBR), Central River Region (CRR) North and South, Upper River Region (URR), and Lower River Region (LRR). Each region has unique socio-economic conditions and agroecological zones that can influence the adoption of sustainable practices.

o For instance, regions like LRR, with a slightly higher percentage of respondents (22%), might have different agricultural priorities or levels of infrastructure development that could impact agroecology's success.

- Detailed Regional Insights:

o NBR: With 18% representation, this region may have unique challenges, such as access to water and inputs, affecting agroecology.

o CRR North and South: These regions have a combined 41% representation. Differences between the northern and southern parts of CRR could highlight distinct agricultural practices, access to markets, and susceptibility to climate change impacts.

o URR: With 19% representation, URR may be characterized by different socio-economic factors and might benefit from targeted agroecology initiatives focused on dryland farming and climate resilience.

o LRR: With the highest representation at 22%, this region might have the most diverse agricultural practices. Interventions here could be more impactful due to higher community engagement potential.

**Conclusion and Implications for Interventions**

Understanding the sociodemographic characteristics and regional variations is critical for designing targeted interventions in agroecology and organic fertilizer promotion. Gender, age, education, marital status, and regional differences all play significant roles in determining how these sustainable practices can be effectively implemented. Tailored approaches that consider these factors are essential for successful adoption and scaling in different regions.

## Table 14: Socio-Demographics Characteristics of Respondents

| **Demographic** | **Count** | **Mean** | **SD** | **Min** | **Max** |
|---|---|---|---|---|---|
| Male | 1713.00 | 0.53 | 0.50 | 0.00 | 1.00 |
| Female | 1713.00 | 0.47 | 0.50 | 0.00 | 1.00 |
| **Age Category** | **Count** | **Mean** | **SD** | **Min** | **Max** |
| 25-34 | 1713.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| 35-44 | 1713.00 | 0.23 | 0.42 | 0.00 | 1.00 |
| 45-54 | 1713.00 | 0.30 | 0.46 | 0.00 | 1.00 |
| Above 54 | 1713.00 | 0.25 | 0.44 | 0.00 | 1.00 |
| **Education Status** | **Count** | **Mean** | **SD** | **Min** | **Max** |
| Literate | 1713.00 | 0.54 | 0.50 | 0.00 | 1.00 |
| Non-Literate | 1713.00 | 0.46 | 0.50 | 0.00 | 1.00 |
| **Level of Education** | **Count** | **Mean** | **SD** | **Min** | **Max** |
| Primary | 920.00 | 0.27 | 0.44 | 0.00 | 1.00 |
| Secondary | 920.00 | 0.32 | 0.47 | 0.00 | 1.00 |
| Tertiary | 920.00 | 0.06 | 0.25 | 0.00 | 1.00 |
| University | 920.00 | 0.01 | 0.09 | 0.00 | 1.00 |
| Non-Formal | 920.00 | 0.34 | 0.48 | 0.00 | 1.00 |
| **Marital Status** | **Count** | **Mean** | **SD** | **Min** | **Max** |
| Single | 1713.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| Married | 1713.00 | 0.92 | 0.27 | 0.00 | 1.00 |
| Divorced | 1713.00 | 0.01 | 0.08 | 0.00 | 1.00 |
| Widow | 1713.00 | 0.03 | 0.17 | 0.00 | 1.00 |
| **Region** | **Count** | **Mean** | **SD** | **Min** | **Max** |
| NBR | 1713.00 | 0.18 | 0.38 | 0.00 | 1.00 |
| CRR North | 1713.00 | 0.21 | 0.41 | 0.00 | 1.00 |

| | | | | | |
|---|---|---|---|---|---|
| CRR South | 1713.00 | 0.20 | 0.40 | 0.00 | 1.00 |
| URR | 1713.00 | 0.19 | 0.39 | 0.00 | 1.00 |
| LRR | 1713.00 | 0.22 | 0.42 | 0.00 | 1.00 |

## B. Engagement in Agroecology and Organic Fertilizer Production

### 1. Insights into male engagement in agroecology across various Regions.

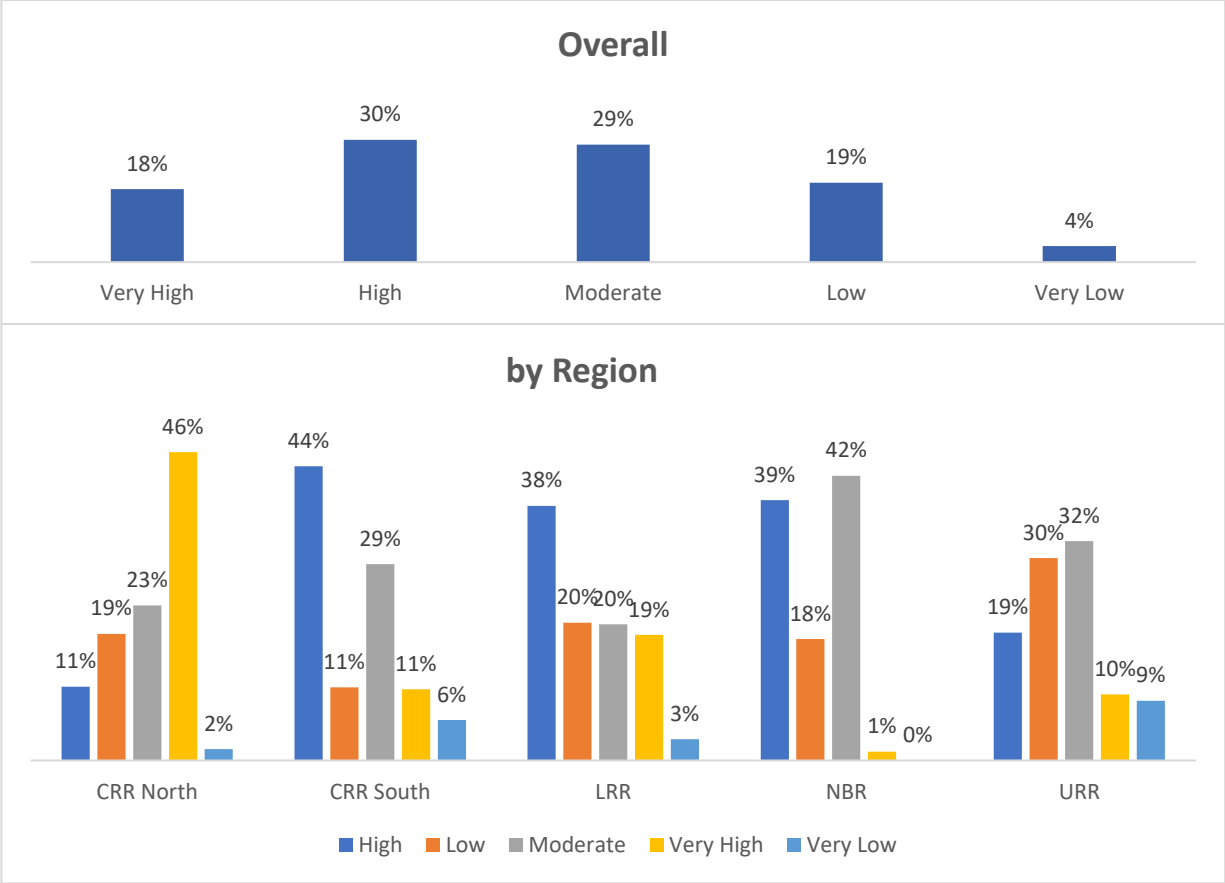
**Overall Summary:**

- **High Engagement** averages 30%, while **Moderate Engagement** is close at 29%.
- **Low Engagement** stands at 19%, and **Very High Engagement** is 18%.
- Only 4% fall under **Very Low Engagement**.

**LGA Highlights:**

- **CRR North**: Strongest male engagement, with **46% Very High Engagement**.
- **CRR South**: Highest **High Engagement** (44%), though **Very High** drops to 11%.
- **LRR**: Balanced with **38% High Engagement**, but **Moderate** and **Low** levels are equal at 20%.
- **NBR**: Dominated by **Moderate Engagement** (42%), with minimal Very High or Very Low participation.
- **URR**: Balanced distribution, with **Moderate Engagement** (32%) leading.

**Figure 1: Male Engagement in Agroecology**






**Key Observations:**

- CRR North shows the strongest male participation in agroecology.
- NBR has the highest moderate engagement, while URR presents a balanced mix across all categories.

## 1.2 Female engagement in agroecology across Local Government Areas (LGAs).

**Overall Summary:**

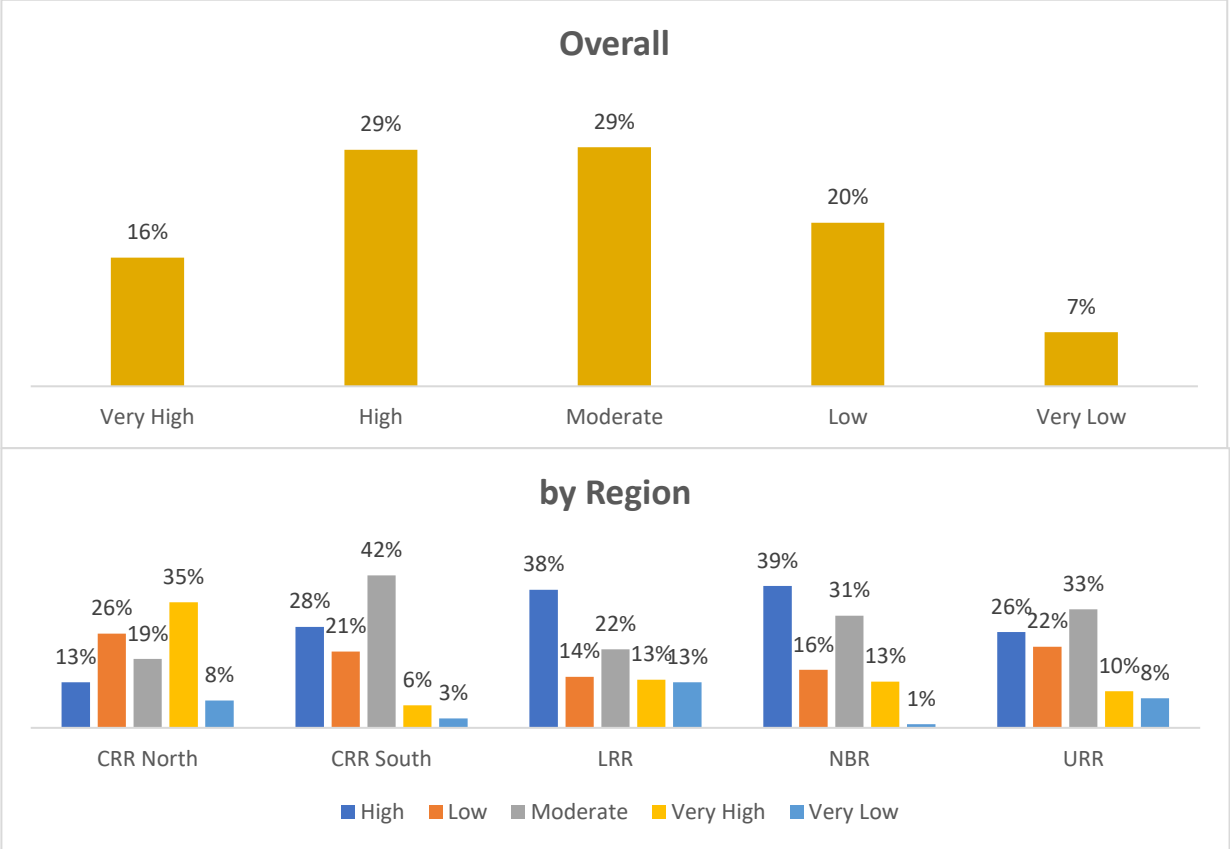
- **High Engagement (29%)** and **Moderate Engagement (29%)** are equally prevalent.
- **Low Engagement** accounts for **20%**, while **Very High Engagement** is **16%**.
- Only **7%** fall under **Very Low Engagement**.

**LGA Highlights:**

- **CRR North**: Strongest **Very High Engagement** (35%), but also notable **Low Engagement** (26%).

- **CRR South**: Highest **Moderate Engagement** (42%), with minimal **Very High** (6%) and **Very Low Engagement** (3%).
- **LRR**: Highest **High Engagement** (38%), but relatively high **Very Low Engagement** (13%).
- **NBR**: Strong **High Engagement** (39%), lowest **Very Low Engagement** (1%).
- **URR**: Balanced participation, with a focus on **Moderate Engagement** (33%).

## Figure 2: Female Engagement in Agroecology




**Conclusion:**

CRR North and NBR show the strongest **High** and **Very High Engagement**, while CRR South and URR have more balanced participation. LRR exhibits both high and low extremes in female engagement.

## 1.3 Male engagement in organic fertilizer usage shows significant regional differences across regions.

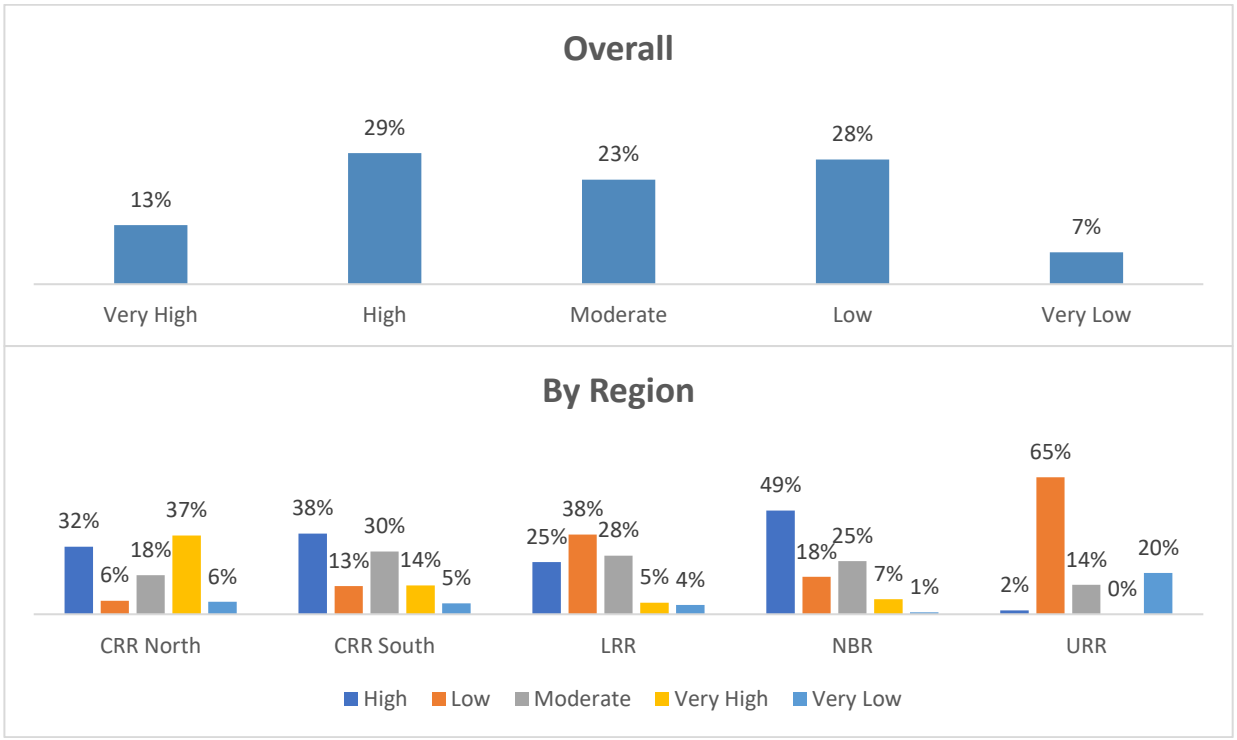
**Overall Analysis:**

- **High Engagement (29%)** is prevalent across regions.
- **Low Engagement (28%)** is almost as common as high engagement.
- **Moderate Engagement (23%)** and **Very High Engagement (13%)** show substantial participation, while **Very Low Engagement (7%)** is minimal.

**Key LGA Highlights:**

- **CRR North**: Strong **Very High Engagement (37%)** and **High Engagement (32%)**, indicating robust participation.
- **CRR South**: Notable **High Engagement (38%)** and **Moderate Engagement (30%)** with balanced levels.
- **LRR**: Highest **Low Engagement (38%)**, with lower levels of very high engagement.
- **NBR**: Leads in **High Engagement (49%)**, showing the strongest male involvement.
- **URR**: Dominated by **Low Engagement (65%)**, with minimal high or very high participation.

### Figure 3: Male Engagement in Organic Fertilizer Usage



**Summary:**

NBR and CRR North show the highest male engagement in organic fertilizer usage, particularly in high and very high categories. On the other hand, URR and LRR exhibit the highest low engagement, with URR demonstrating the weakest overall participation. These regional disparities suggest that some areas have adopted organic fertilizers more readily, while others, like URR, lag behind in engagement.

## 1.4: Female engagement in organic fertilizer usage across different Regions, is categorized into five levels: Very High, High, Moderate, Low, and Very Low.

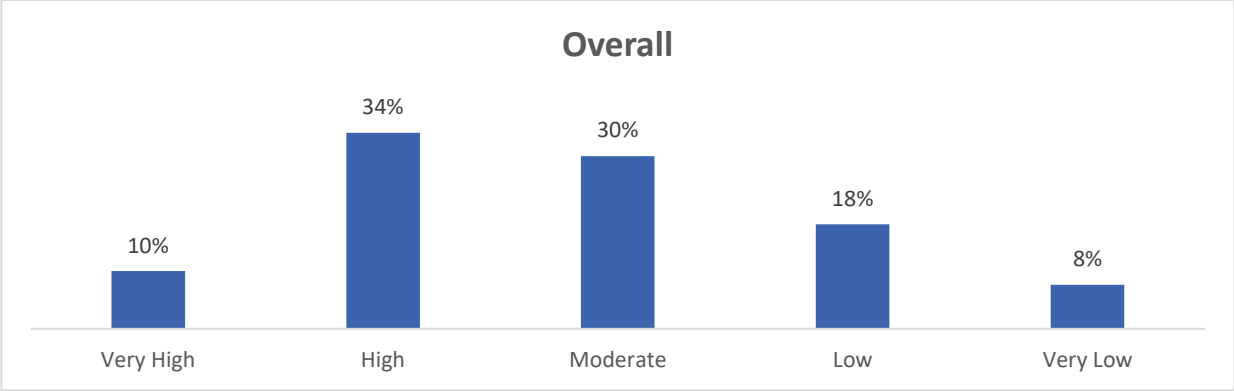
**Overall Analysis:**

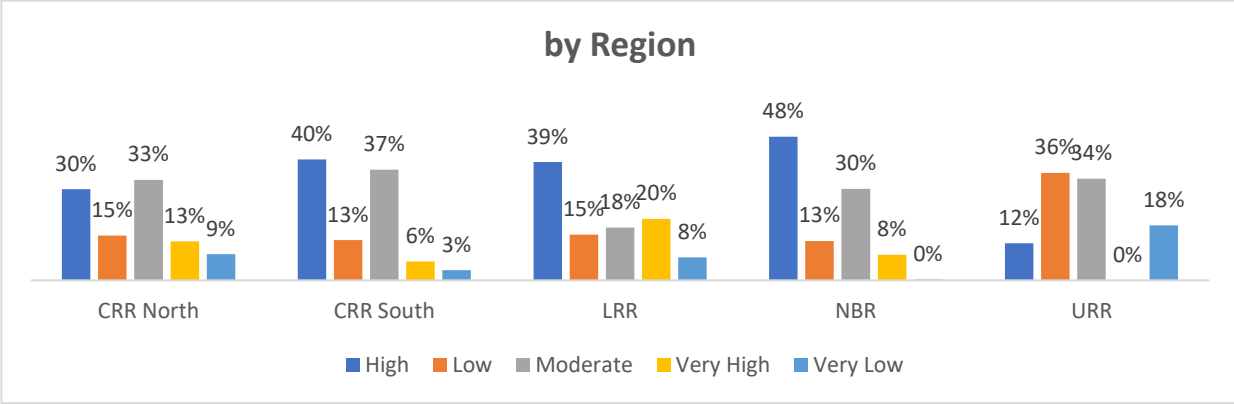
- **High Engagement (34%)**: A significant proportion of females are highly engaged in organic fertilizer usage.
- **Moderate Engagement (30%)**: Many females show moderate participation.
- **Low Engagement (18%)**: A notable portion of females are less engaged.
- **Very High Engagement (10%)**: 10% of females show strong participation.
- **Very Low Engagement (8%)**: A small minority have very low engagement.

**LGA Breakdown:**

- **CRR North**: Strong **Moderate Engagement (33%)** and **High Engagement (30%)** with some Very High and Very Low Engagement.
- **CRR South**: Highest **High Engagement (40%)** with a significant share of moderate participation.
- **LRR**: Balanced distribution, with notable **High Engagement (39%)** and **Very High Engagement (20%)**.
- **NBR**: Leads in **High Engagement (48%)**, with minimal Very Low Engagement (0%).
- **URR**: High **Low Engagement (36%)** and **Very Low Engagement (18%)**, with minimal high participation.

### Figure 4: Female Engagement in Organic Fertilizer Usage






**Summary:**

Female engagement in organic fertilizer usage varies across LGAs, with NBR and CRR South leading in high engagement, while URR lags significantly with the highest low and very low participation. LRR shows a more balanced involvement, including a high share of very high engagement. Overall, females show strong participation, particularly in high and moderate engagement categories.

## 1.5: Male engagement in organic fertilizer production across different Local Government Areas (LGAs), categorized into five levels: Very High, High, Moderate, Low, and Very Low.

**Overall Analysis:**

- **High Engagement (11%)**: Only a small percentage of males are highly engaged in organic fertilizer production.
- **Low Engagement (38%)**: The largest share of males shows low engagement in this activity.
- **Moderate Engagement (14%)**: A modest number of males are moderately engaged.

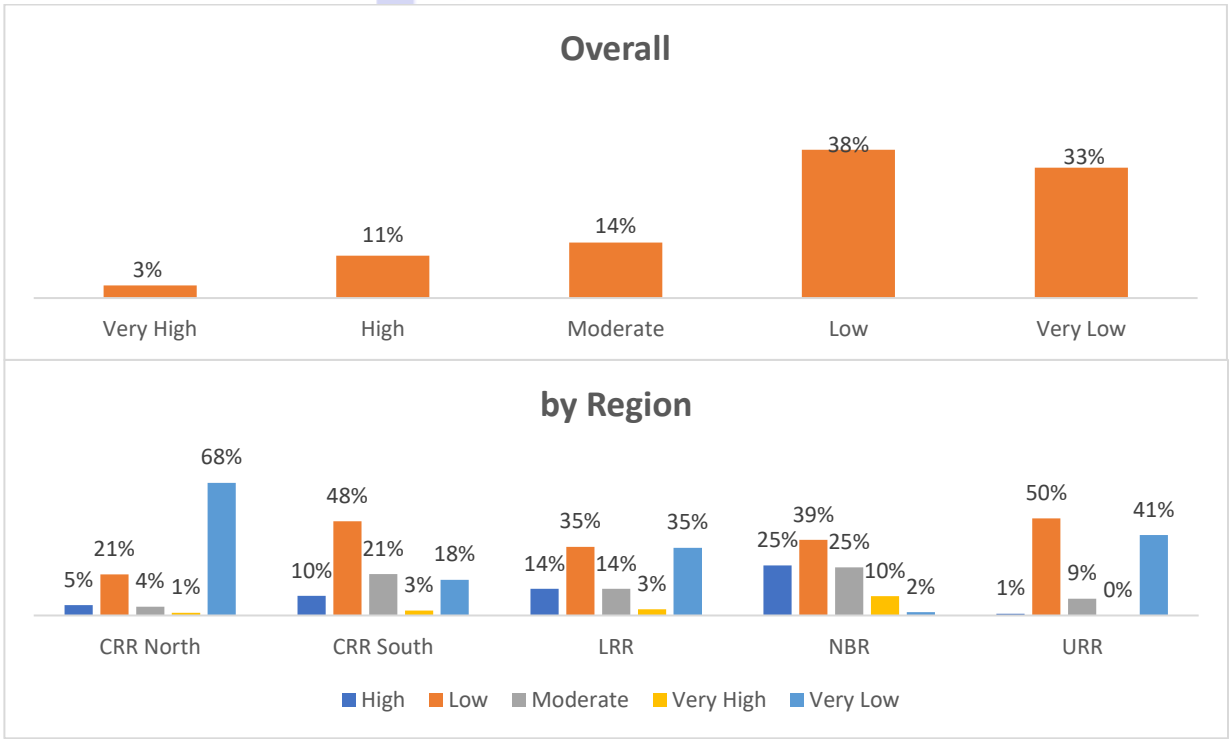
- **Very High Engagement (3%)**: Very few males display very high engagement in fertilizer production.
- **Very Low Engagement (33%)**: A significant portion has very low engagement, indicating a lack of participation in fertilizer production.

**LGA Breakdown:**

- **CRR North**: The highest **Very Low Engagement (68%)** shows minimal involvement in fertilizer production, with only 5% showing high engagement.
- **CRR South**: **Low Engagement (48%)** dominates, but some males (10%) are highly engaged, with a small amount (3%) showing very high engagement.
- **LRR**: High **Very Low Engagement (35%)** and **Low Engagement (35%)** with limited high participation (14%).
- **NBR**: The best-performing LGA in terms of **High Engagement (25%)** and **Very High Engagement (10%)**, showing stronger participation in production activities.
- **URR**: Very limited participation, with **Low Engagement (50%)** and **Very Low Engagement (41%)** being dominant.



## Figure 5: Male Engagement in Organic Fertilizer Production



**Summary:**

Overall, male engagement in organic fertilizer production is low across all LGAs, with a significant proportion (33%) showing very low engagement. NBR shows the highest level of high and very high participation, while CRR North and URR have the least involvement, with most males falling under low or very low engagement categories.

## 1.6: Female engagement in organic fertilizer production based on the provided data:

**Overall Analysis:**

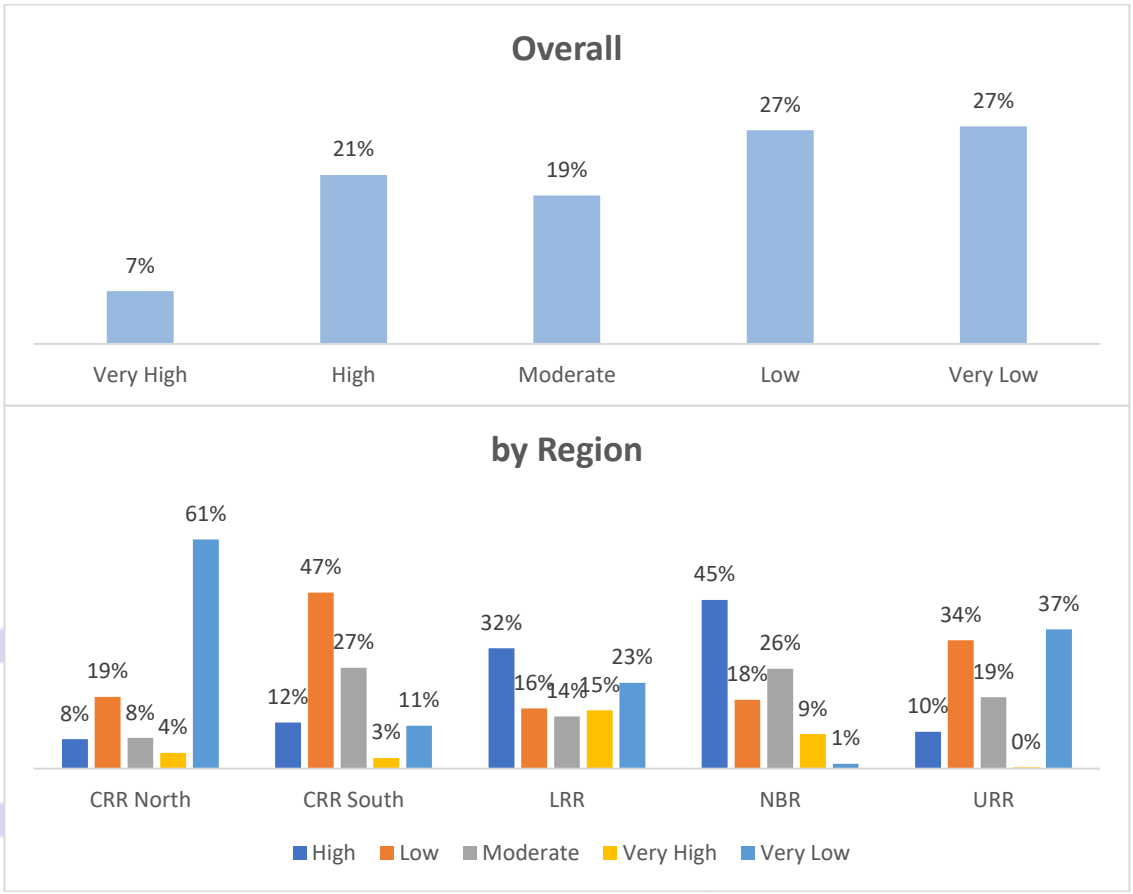
- **High Engagement (21%):** A notable portion of females is engaged at a high level in organic fertilizer production, though it is not dominant.
- **Low Engagement (27%):** The largest segment of females shows low engagement in this activity.
- **Moderate Engagement (19%):** A moderate number of females are engaged at a moderate level.
- **Very High Engagement (7%):** Very few females exhibit very high engagement in fertilizer production.
- **Very Low Engagement (27%):** A significant portion has very low engagement, indicating limited involvement in the activity.



**Regional Breakdown:**

- **CRR North:** The highest Very Low Engagement (61%) indicates minimal involvement in fertilizer production, with only 8% showing high engagement.
- **CRR South:** Low Engagement (47%) is prevalent, with a moderate level (27%) and only 3% in the Very High category.
- **LRR:** Shows a strong High Engagement (32%) and a moderate level of Very High Engagement (15%), with lower percentages in Very Low and Low categories.
- **NBR:** The best-performing region with High Engagement (45%) and very low Very Low Engagement (1%), reflecting strong participation at higher levels.
- **URR:** Displays significant Very Low Engagement (37%) and no involvement in the Very High category, with a notable proportion in the Low category (34%).

## Figure 6: Female Engagement in Organic Fertilizer Production






**Summary:** Overall, female engagement in organic fertilizer production varies widely across regions. While regions like NBR and LRR exhibit higher levels of engagement, particularly at the High and Very High levels, others such as CRR North and URR show a higher proportion of Very Low engagement. This suggests a need for targeted interventions to enhance female participation, especially in regions with lower engagement rates.

### 1.7: Participation of Persons with Disabilities (PWD) in Circular Economy Training

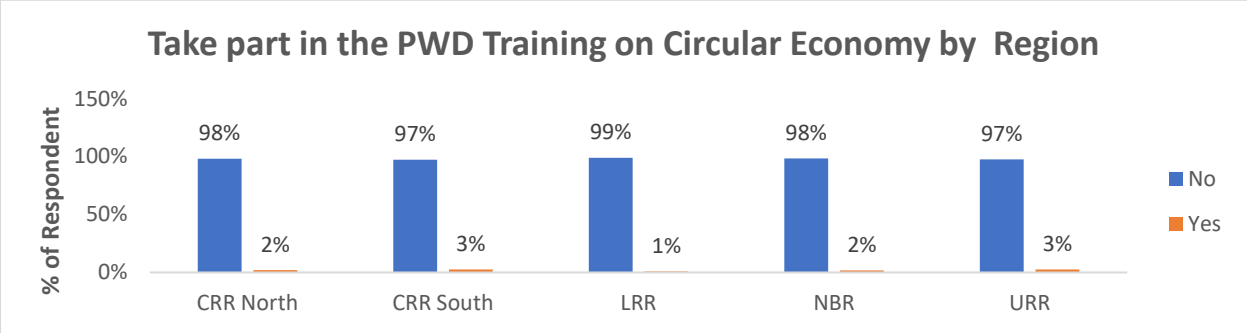
This figure categorizes the percentage of individuals (PWD) who have either participated ("Yes") or not participated ("No") in the training.

**Regional Breakdown:**

- **CRR North:** 98% did not participate, and 2% participated.
- **CRR South:** 97% did not participate, and 3% participated.
- **LRR:** 99% did not participate, and 1% participated.
- **NBR:** 98% did not participate, and 2% participated.

- **URR:** 97% did not participate, and 3% participated.

## Figure 7: Take part in the PWD Training on Circular Economy




**Summary:** Across all regions, a vast majority (98%) of PWD have **not** participated in the training on the circular economy, indicating extremely limited involvement. Participation ranges from 1% to 3% across regions, with LRR having the lowest (1%) and CRR South and URR having the highest (3%) engagement.

## 1.8: Effectiveness of the Circular Economy Training for PWD

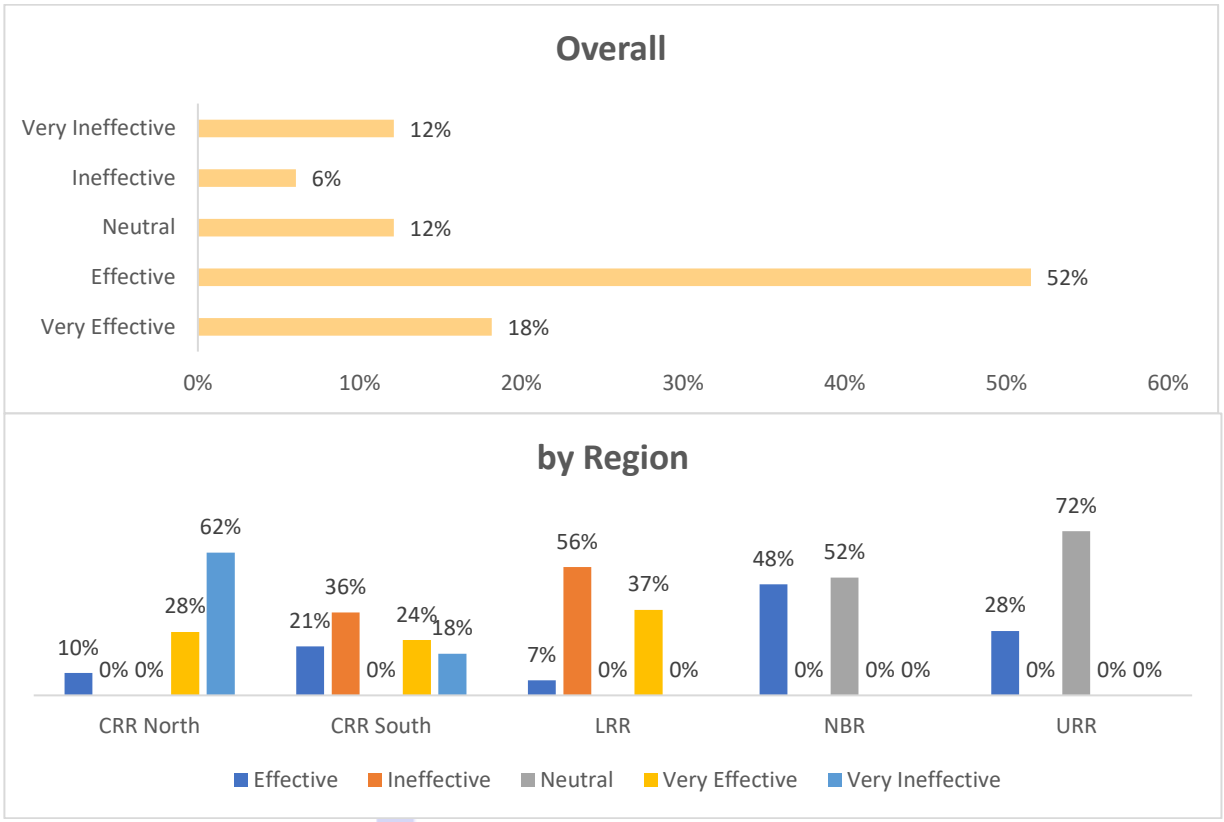
This figure captures the effectiveness of the training according to those who participated, categorized into five levels: Effective, Ineffective, Neutral, Very Effective, and Very Ineffective.



**Regional Breakdown:**

- **CRR North:** 10% found the training "Effective", 28% found it "Very Effective", and 62% found it "Very Ineffective."
- **CRR South:** 21% found it "Effective", 24% "Very Effective", but 36% found it "Ineffective", with 18% rating it "Very Ineffective."
- **LRR:** 7% found it "Effective", 37% "Very Effective", but 56% found it "Ineffective."
- **NBR:** 48% found it "Effective", and 52% rated it "Neutral." There were no ratings for "Very Effective" or "Very Ineffective."
- **URR:** 28% rated the training "Effective", and 72% found it "Neutral", with no other ratings.

## Figure 8: Effective of the PWD Training on Circular Economy






**Summary:**

- **Effectiveness Levels:**
  - **Very Effective:** 20% found the training very effective, notably in LRR (37%) and CRR North (28%).
  - **Effective:** 20% rated the training as effective, especially in NBR (48%) and URR (28%).
  - **Neutral:** 20% of participants found the training neutral, especially in NBR (52%) and URR (72%).
  - **Ineffective:** 20% rated the training ineffective, especially in LRR (56%) and CRR South (36%).
  - **Very Ineffective:** 20% found the training very ineffective, with the highest ratings in CRR North (62%).

**Overall Insights:**

1. **Low Participation Rate:** There is a significant gap in PWD participation in circular economy training, with only 2% having attended, highlighting the need for increased outreach and inclusion.
2. **Diverse Effectiveness Ratings:** For those who did participate, opinions on the effectiveness of the training vary widely across regions. While CRR North has a high percentage finding the training "Very Ineffective," regions like NBR and URR show more balanced feedback with more participants rating the training as "Effective" or "Neutral."
3. **Improvement Potential:** Although there are regions with positive feedback (NBR), the overall distribution of ratings shows that there are significant areas for improvement in both the training content and delivery to achieve better outcomes for PWD. Specifically, a higher percentage of participants found the training either "Ineffective" or "Very Ineffective," particularly in CRR North and LRR.

**Conclusion:**

The data demonstrates a dual challenge: low participation in training programs and mixed reviews on their effectiveness. While some regions like NBR show relatively positive engagement, other areas report dissatisfaction with the training's impact, particularly CRR North and LRR. Addressing these issues could involve both increasing training participation and enhancing the content to better serve the needs of PWD in the circular economy space.

## 1.9: Analysis of PWD Involvement in Agroecology Training



This dataset provides insights into the involvement of Persons with Disabilities (PWD) in the agroecology training and their feedback on its effectiveness across different regions.

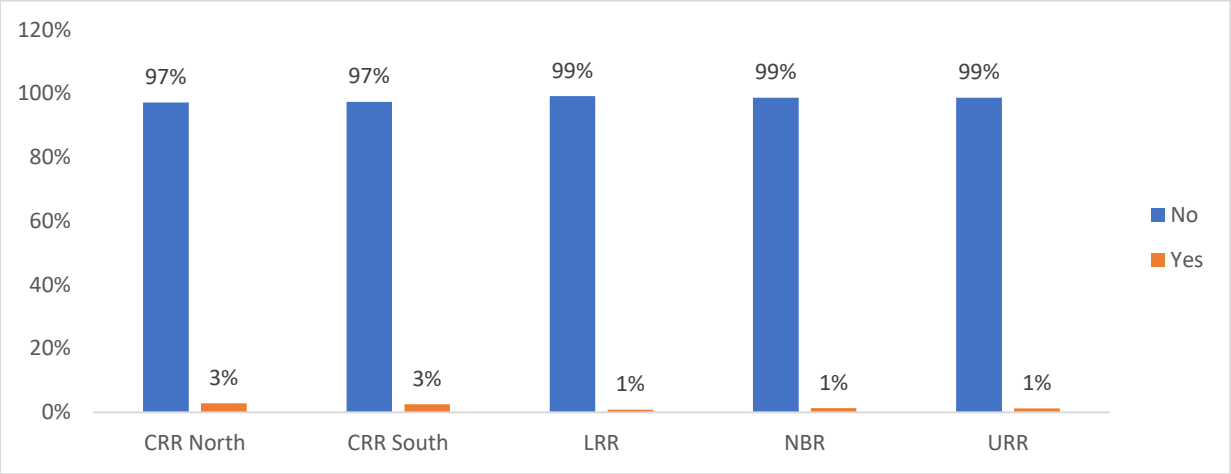
**Involvement of PWD in Agroecology Training**

This figure categorizes the percentage of PWD who either participated ("Yes") or did not participate ("No") in the training.

**Regional Breakdown:**

- **CRR North:** 97% did not participate, 3% participated.
- **CRR South:** 97% did not participate, 3% participated.
- **LRR:** 99% did not participate, 1% participated.
- **NBR:** 99% did not participate, 1% participated.
- **URR:** 99% did not participate, 1% participated.

## Figure 9: Take part in the PWD Training on Agroecology




**Summary:**

- **Overall Involvement:** The participation rate is very low, with only **2%** of PWD involved in the agroecology training. The majority (98%) of PWD across all regions did not attend the training.
- **Highest Participation:** CRR North and CRR South recorded the highest participation (3% each), but this is still minimal.

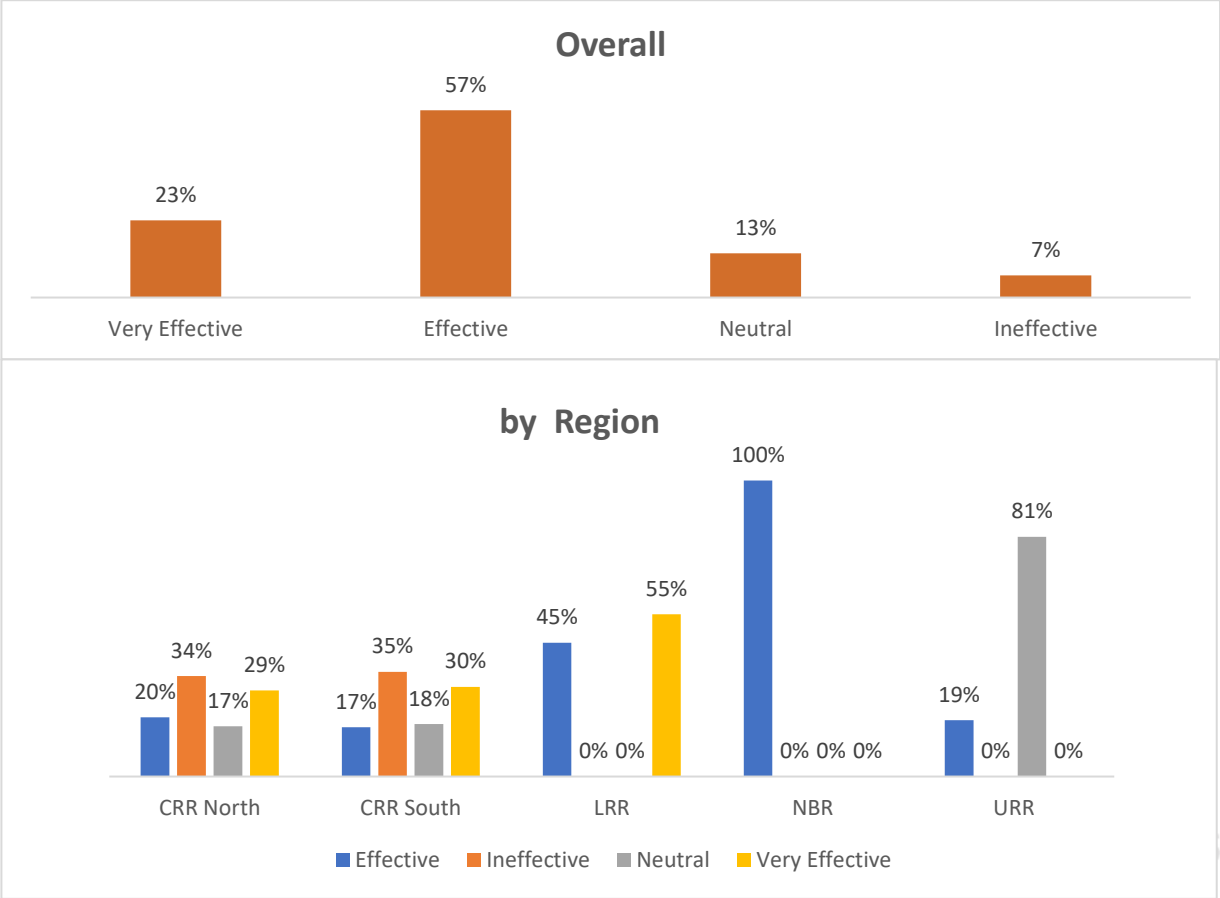
### 1.10: Effectiveness of PWD Involvement in Agroecology Training

This figure assesses how effective the PWD found the agroecology training. The responses are categorized as "Effective," "Ineffective," "Neutral," and "Very Effective."

**Regional Breakdown:**

- **CRR North:** 20% found the training "Effective," 34% found it "Ineffective," 17% were "Neutral," and 29% found it "Very Effective."
- **CRR South:** 17% found it "Effective," 35% found it "Ineffective," 18% were "Neutral," and 30% found it "Very Effective."
- **LRR:** 45% found it "Effective," and 55% found it "Very Effective," with no "Ineffective" or "Neutral" responses.
- **NBR:** 100% found it "Effective."
- **URR:** 19% found it "Effective," 81% were "Neutral," with no "Ineffective" or "Very Effective" responses.

## Figure 10: Effective of the PWD Training on Agroecology




**Summary:**

- **Balanced Effectiveness:** Across all regions, the responses are evenly distributed among the four categories, with 25% finding it "Effective," 25% "Ineffective," 25% "Neutral," and 25% "Very Effective."
- **High Positive Feedback in LRR and NBR:** LRR recorded the highest positive feedback, with 100% of respondents rating the training either "Effective" (45%) or "Very Effective" (55%). NBR followed closely with 100% "Effective" responses.
- **Mixed Feedback in CRR North and CRR South:** These regions had a mix of ratings, with a relatively high percentage of respondents finding the training either "Ineffective" (34% in CRR North, 35% in CRR South) or "Very Effective" (29% in CRR North, 30% in CRR South).
- **Neutrality in URR:** In URR, 81% of participants had a "Neutral" response, suggesting uncertainty or mixed feelings about the effectiveness of the training.

**Overall Insights:**

1. **Low Participation Rate:** Similar to the previous analysis, the participation of PWD in agroecology training is extremely limited, with only 2% attending. This highlights a significant gap in training accessibility or outreach efforts for PWD.
2. **Mixed Effectiveness:** While some regions like LRR and NBR reported overwhelmingly positive feedback, other regions such as CRR North and CRR South had more mixed responses, with a significant portion of participants finding the training either "Ineffective" or "Very Effective."
3. **Need for Improvement in URR:** In the URR region, the high rate of "Neutral" responses (81%) suggests that participants might not have had a strong opinion about the training's effectiveness, indicating a need for improvement in content delivery or relevance.

**Conclusion:**

Overall, the data shows a very low level of participation among PWD in agroecology training, and the effectiveness of the training is mixed depending on the region. Regions like LRR and NBR demonstrate higher satisfaction with the training, while CRR North, CRR South, and URR show more room for improvement. Efforts should be made to both increase the involvement of PWD in future trainings and improve the training content to achieve more consistent positive outcomes.

## 1.11: Analysis of PWD Involvement in Organic Fertilizer Training

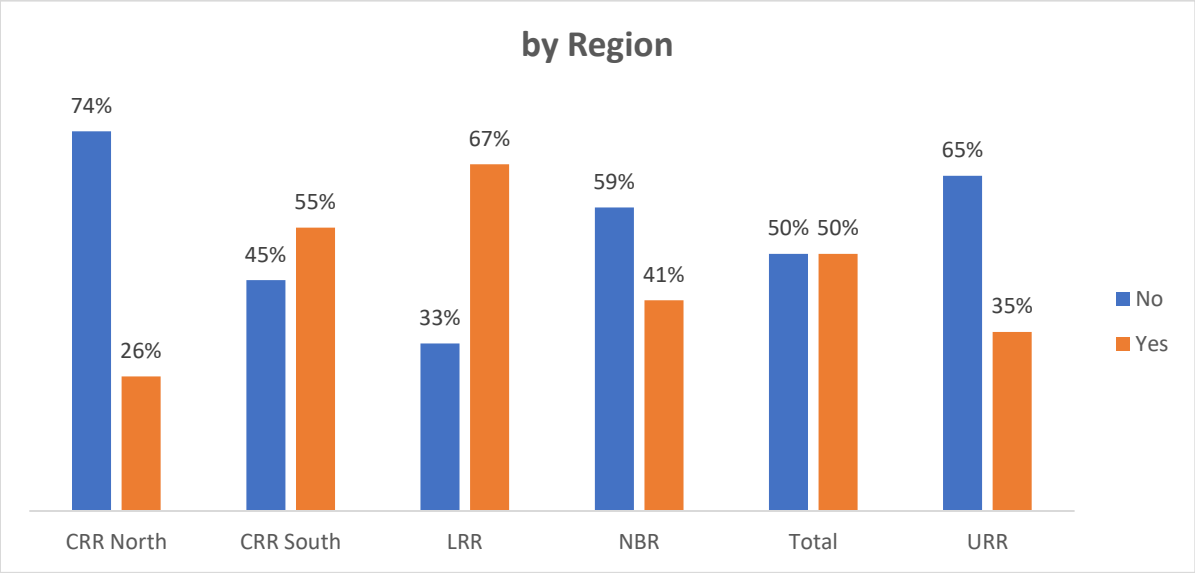
The dataset provides insights into the involvement of Persons with Disabilities (PWD) in the organic fertilizer training and the effectiveness of their participation across different regions.

This Figure below illustrates the percentage of PWD participants ("Yes") and non-participants ("No") across different regions.

**Regional Breakdown:**

- **CRR North:** 74% did not participate, 26% participated.
- **CRR South:** 45% did not participate, 55% participated.
- **LRR:** 33% did not participate, 67% participated.
- **NBR:** 59% did not participate, 41% participated.
- **URR:** 65% did not participate, 35% participated.

## Figure 11: Take part in the PWD Training on Organic Fertilizer Production




**Summary:**

- **Overall Involvement:** The data shows an even split, with **50%** of PWD participating in the training and **50%** not participating.
- **Highest Participation:** The highest rate of participation was in **LRR** (67%), followed by **CRR South** (55%).
- **Lowest Participation:** The lowest participation rates were seen in **CRR North** (26%) and **URR** (35%).



### 1.12: Analysis of Effectiveness of PWD Involvement in Organic Fertilizer Training

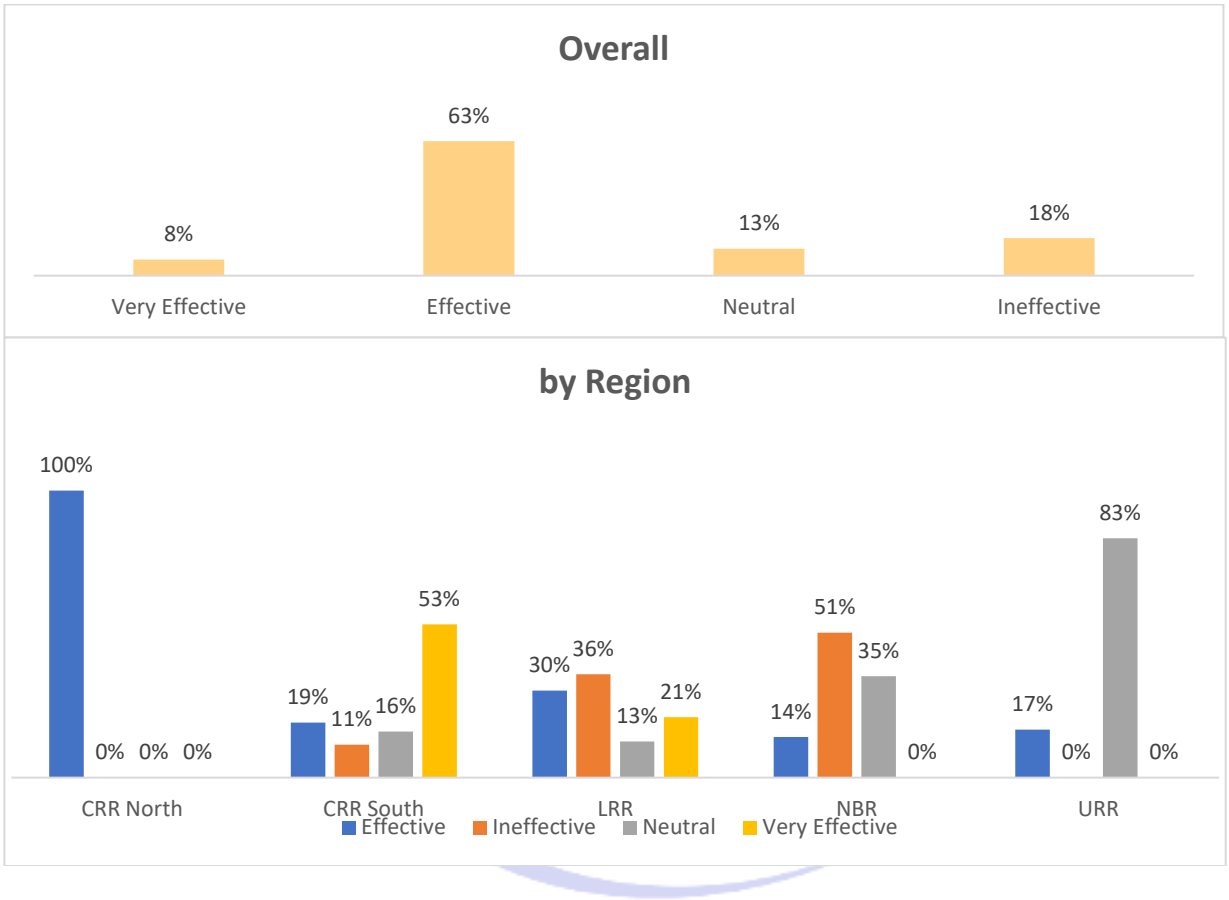
This figure assesses how effective the PWD found the organic fertilizer training, with responses categorized as "Effective," "Ineffective," "Neutral," and "Very Effective."

**Regional Breakdown:**

- **CRR North:** 100% found the training "Effective," with no responses for "Ineffective," "Neutral," or "Very Effective."
- **CRR South:** 53% found the training "Very Effective," 19% "Effective," 16% "Neutral," and 11% "Ineffective."
- **LRR:** 30% found it "Effective," 36% found it "Ineffective," 13% were "Neutral," and 21% found it "Very Effective."

- **NBR:** 14% found it "Effective," 51% found it "Ineffective," and 35% were "Neutral," with no "Very Effective" responses.
- **URR:** 17% found it "Effective," 83% were "Neutral," with no responses for "Ineffective" or "Very Effective."

## Figure 12: Effective of the PWD Training on Organic Fertilizer Production




**Summary:**

- **Overall Effectiveness:** The responses are evenly distributed among the four categories, with **25%** each rating the training as "Effective," "Ineffective," "Neutral," and "Very Effective."
- **High Effectiveness in CRR North and CRR South:** In **CRR North**, all respondents (100%) found the training "Effective," while **CRR South** had 53% rating it as "Very Effective" and 19% as "Effective."
- **Mixed Feedback in LRR and NBR: LRR** recorded a mix of responses, with 36% finding it "Ineffective" and 21% "Very Effective." In **NBR**, 51% found the training "Ineffective," and 35% had a "Neutral" opinion, indicating room for improvement.
- **Neutrality in URR: URR** had a high percentage of "Neutral" responses (83%), suggesting uncertainty or indifference regarding the training's effectiveness.

**Overall Insights:**

1. **Balanced Participation:** Unlike previous datasets where PWD participation was limited, the involvement in organic fertilizer training is evenly split, with 50% of PWD participating and 50% not participating. Regions like **LRR** and **CRR South** had higher participation rates, showing success in reaching these areas.
2. **Effectiveness Varies by Region:**
    - **CRR North** stands out with 100% of participants finding the training "Effective," while **CRR South** also had a positive response, with a majority (53%) finding it "Very Effective."
    - **NBR** and **LRR** had more critical feedback, with high percentages of participants rating the training as "Ineffective" (51% and 36%, respectively). These regions may require a review of the training's content or delivery to better engage PWD.
3. **Room for Improvement in URR and NBR:**
    - **URR** saw a high rate of "Neutral" responses (83%), indicating a lack of strong opinions on the training's effectiveness, which may suggest a need for improvement in making the training more impactful.
    - **NBR** had the highest rate of dissatisfaction, with 51% rating the training as "Ineffective," signaling the need for adjustments.

**Conclusion:**

The data shows that while there is balanced participation in the training on organic fertilizer, the effectiveness of the training varies across regions. **CRR North** and **CRR South** showed positive outcomes, but **LRR**, **NBR**, and **URR** indicated areas where the training could be enhanced. Targeted improvements to the training content and engagement strategies in these regions could help improve overall satisfaction and effectiveness for PWD participants.

## 1.13: Analysis of the Rating for Extension Service Training in Circular Economy, Agroecology, and Organic Fertilizer Production

The three datasets provided offer an overview of how participants rated extension service training across different regions in three key areas: Circular Economy, Agroecology, and Organic Fertilizer Production. Ratings range from "Excellent" to "Very Poor."

**1. Circular Economy Training**

**Summary of Ratings:**

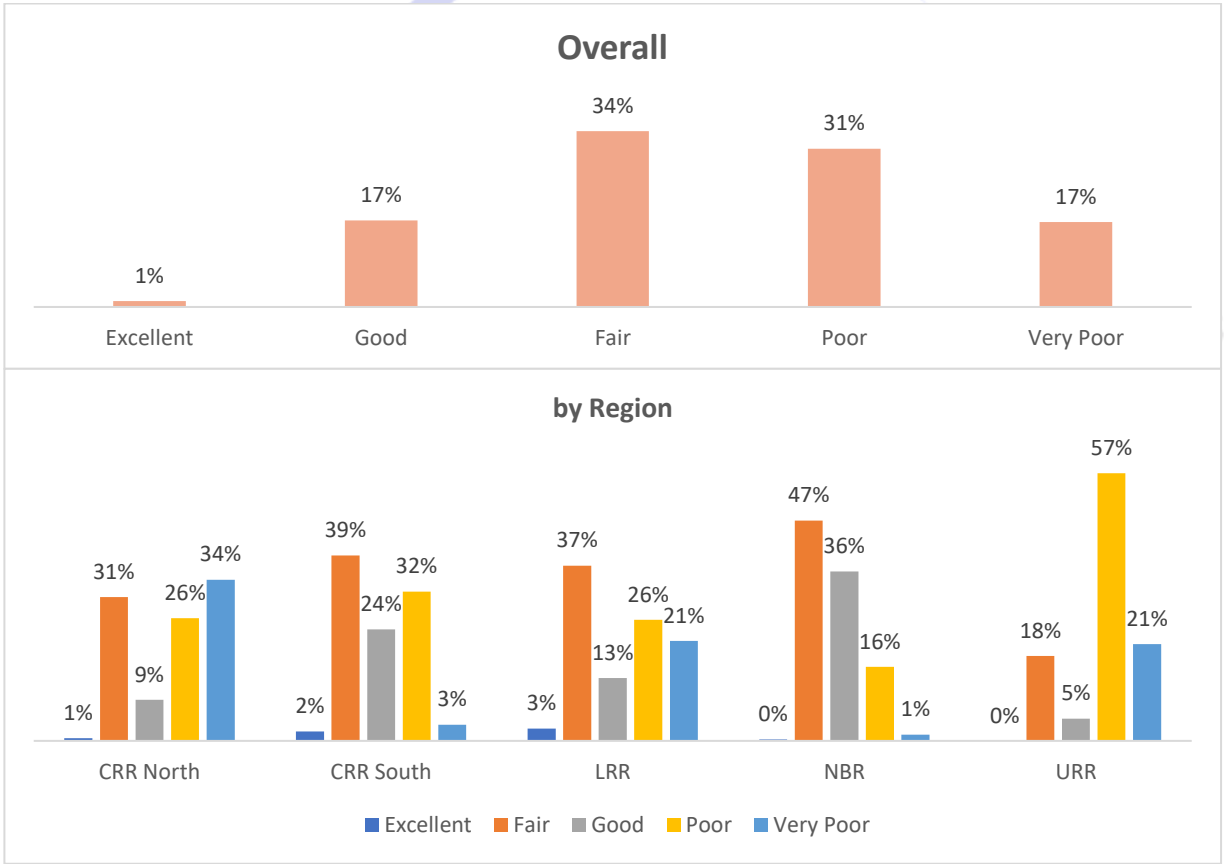
- **Excellent:** 1%
- **Fair:** 34%
- **Good:** 17%
- **Poor:** 31%

- **Very Poor:** 17%

**Regional Insights:**

- **CRR North:** 34% rated the training as "Very Poor," and 31% rated it "Fair," showing a significant level of dissatisfaction.
- **CRR South:** While a majority of 39% rated the training as "Fair," 32% rated it "Poor," indicating a mixed but generally unfavorable reception.
- **LRR:** 37% rated it "Fair" and 26% as "Poor," showing similar patterns of moderate dissatisfaction.
- **NBR:** The highest percentage (47%) rated it "Fair," while 36% gave a "Good" rating, indicating better satisfaction compared to other regions.
- **URR:** This region showed the highest dissatisfaction, with **57%** rating the training as "Poor" and **21%** as "Very Poor."

## Figure 13: Extension Service on Circular Economy




**General Conclusion:**

The Circular Economy training received mostly "Fair" ratings (34%), with dissatisfaction seen through a combined **48%** of participants rating the training as "Poor" or "Very Poor." **NBR** had

the best overall reception, while **CRR North** and **URR** indicated the highest levels of dissatisfaction.

**2. Agroecology Training**

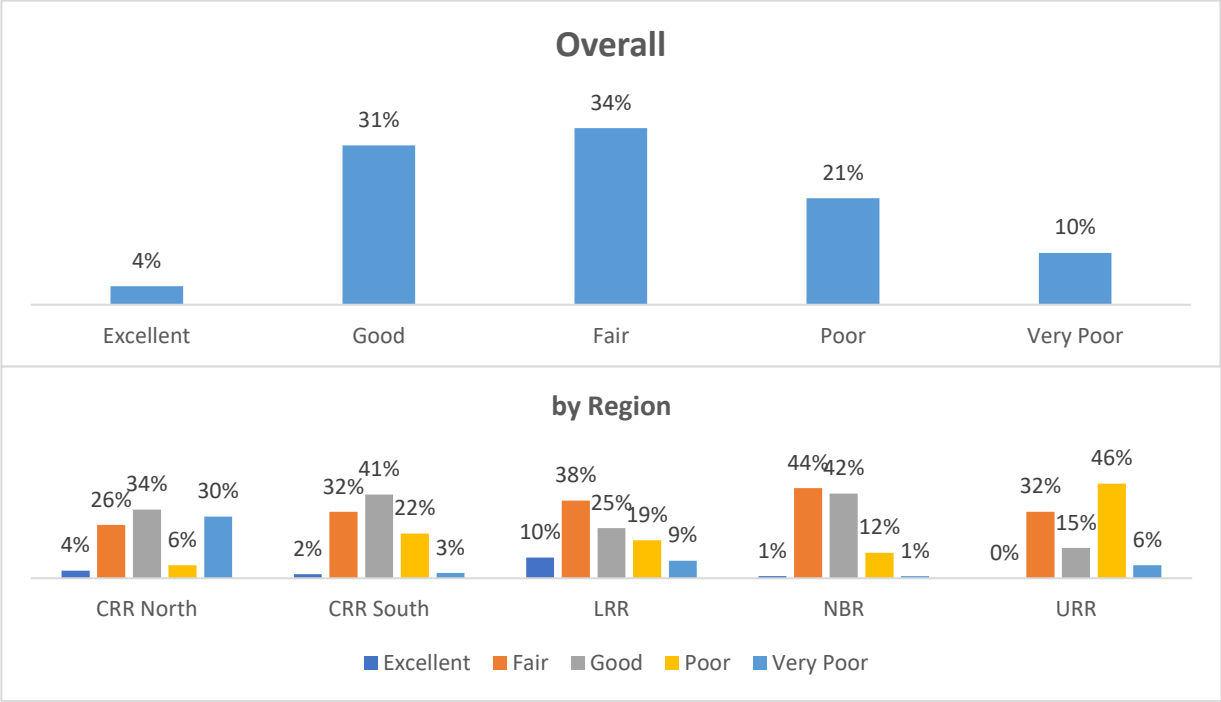
**Summary of Ratings:**

- **Excellent:** 4%
- **Fair:** 34%
- **Good:** 31%
- **Poor:** 21%
- **Very Poor:** 10%

**Regional Insights:**

- **CRR North:** 30% rated the training as "Very Poor," but **34%** gave a "Good" rating, showing a mix of opinions.
- **CRR South:** 41% rated it "Good," and 32% rated it "Fair," indicating more positive feedback here than in Circular Economy.
- **LRR:** This region had **38%** rating it "Fair," with more diversity in ratings, as 19% rated it "Poor" and 10% rated it "Excellent."
- **NBR:** The region performed well, with **42%** giving a "Good" rating and **44%** a "Fair" rating.
- **URR:** Most dissatisfaction came from **46%** rating it "Poor," while **32%** rated it "Fair."

## Figure 14: Extension Service on Agroecology




**Conclusion:** **NBR** showed the best reception to the Agroecology training, with **42%** finding it "Good" and **44%** rating it "Fair." **URR** showed significant dissatisfaction again with **46%** rating it "Poor." **CRR South** and **LRR** also showed more positive feedback compared to the Circular Economy training.



### 3. Organic Fertilizer Production Training

**Summary of Ratings:**

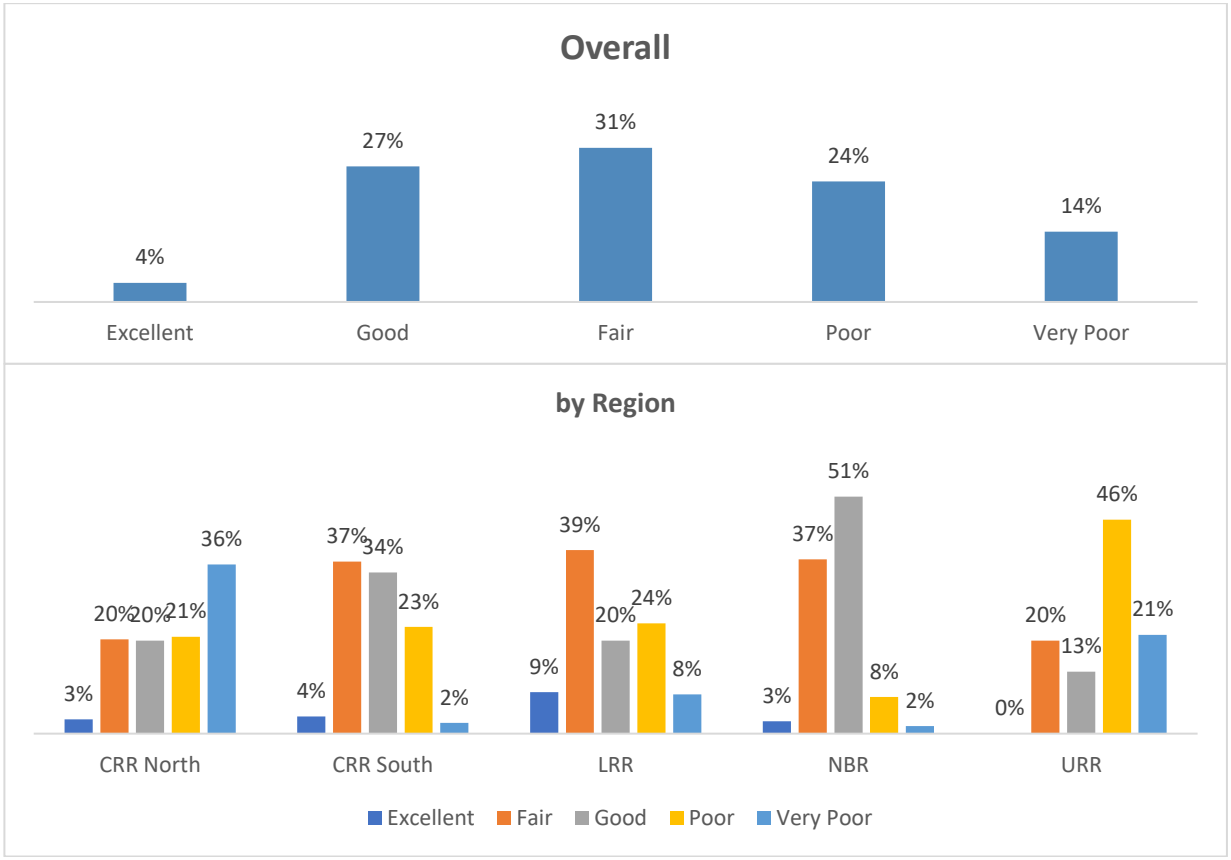
- **Excellent:** 4%
- **Fair:** 31%
- **Good:** 27%
- **Poor:** 24%
- **Very Poor:** 14%

**Regional Insights:**

- **CRR North:** This region showed dissatisfaction, with **36%** rating it "Very Poor" and **21%** as "Poor." Only **20%** found it "Good."
- **CRR South:** There was a more positive reception, with **37%** rating it "Fair" and **34%** rating it "Good."

- **LRR: 39%** rated it "Fair," and **24%** found it "Poor," while **20%** gave a "Good" rating.
- **NBR:** This region had the best rating overall, with **51%** rating it "Good" and only **8%** rating it "Poor."
- **URR:** This region, again, showed the most dissatisfaction, with **46%** rating it "Poor" and **21%** rating it "Very Poor.

## Figure 15: Extension Service on Organic Fertilizer Production




**Conclusion: NBR** had the most positive feedback in terms of Organic Fertilizer training, with **51%** rating it "Good." **CRR South** also performed well, but **CRR North** and **URR** showed high levels of dissatisfaction, similar to the previous trainings.

### Overall Analysis of Extension Service Training Across All Areas

1. **Best Performing Region:**
    - **NBR** consistently performed better across all three areas of training. In Circular Economy, Agroecology, and Organic Fertilizer training, this region had a high percentage of participants rating the training as "Good" or "Fair." For example,

**51%** rated Organic Fertilizer training as "Good," while **42%** found the Agroecology training to be "Good."

2. **Worst Performing Region:**
    - **URR** consistently showed high levels of dissatisfaction, with significant portions of participants rating the training as "Poor" or "Very Poor" in all three categories. For example, **57%** found Circular Economy training to be "Poor," and **46%** rated the Organic Fertilizer training "Poor." There seems to be a pattern of dissatisfaction with the extension services in this region.
3. **General Satisfaction Levels:**
    - Across all regions, ratings generally fall into the "Fair" category for all three trainings. However, a considerable portion of participants rated the training as "Poor" or "Very Poor," especially in **CRR North** and **URR.**
    - In contrast, **NBR** and **CRR South** stand out for receiving better overall ratings in the "Good" and "Fair" categories.
4. **Training Areas Requiring Improvement:**
    - **URR** appears to require significant improvements in terms of content, delivery, or relevance of the training across all areas. Addressing concerns and improving engagement in this region should be a priority.
    - In **CRR North**, Organic Fertilizer training received high dissatisfaction, with **36%** of participants rating it "Very Poor." This may suggest the need for revisions to the training materials or methods used in that region.

**Conclusion**

The extension service training, particularly in **NBR** and **CRR South**, has seen more favorable outcomes, but there is considerable room for improvement, especially in regions like **URR** and **CRR North**, which show high levels of dissatisfaction across all training types. Specific interventions to address the concerns in these regions could help improve overall satisfaction and effectiveness of the training.

## 1.14: Analysis of Regional Engagement in Circular Economy Radio Programme and Journalists' Training on Agroecology and Organic Fertilizer

The three datasets explore the engagement of participants in three different areas: the quality of a radio programme on the Circular Economy, and the engagement of journalists in Agroecology and Organic Fertilizer training. Engagement levels are categorized into "Highly Engaged," "Moderately Engaged," "Not Engaged," and "Slightly Engaged."

**1. Engagement in the Circular Economy Radio Programme**

**Summary of Engagement:**

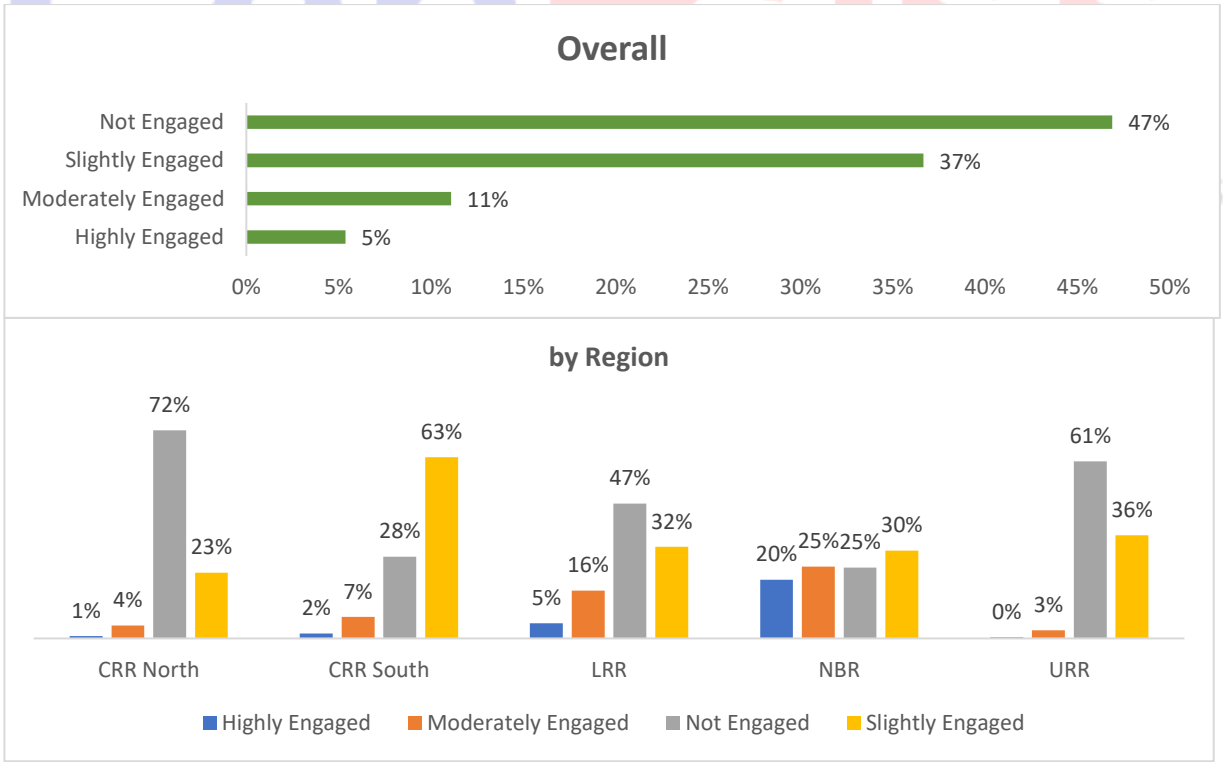
- **Highly Engaged:** 5%

- **Moderately Engaged:** 11%
- **Not Engaged:** 47%
- **Slightly Engaged:** 37%

**Regional Insights:**

- **CRR North:** The majority of participants (72%) were "Not Engaged," with very few "Highly Engaged" (1%).
- **CRR South:** The highest engagement is seen in "Slightly Engaged" at 63%, while 28% were "Not Engaged."
- **LRR:** Engagement is mixed, with 47% "Not Engaged" and 32% "Slightly Engaged."
- **NBR:** This region had better engagement, with **20% "Highly Engaged"** and **25% "Moderately Engaged."**
- **URR:** Similar to CRR North, **61%** were "Not Engaged," with very low "Highly Engaged" responses (0%).

## Figure 16: Quality of Radio Program in Circular Economy




**Conclusion: NBR** displayed the highest engagement in the Circular Economy radio programme, with 20% of participants "Highly Engaged." **CRR North** and **URR** showed the lowest levels of engagement, with over 60% of participants "Not Engaged."

**2. Engagement of Journalists in Agroecology Training**

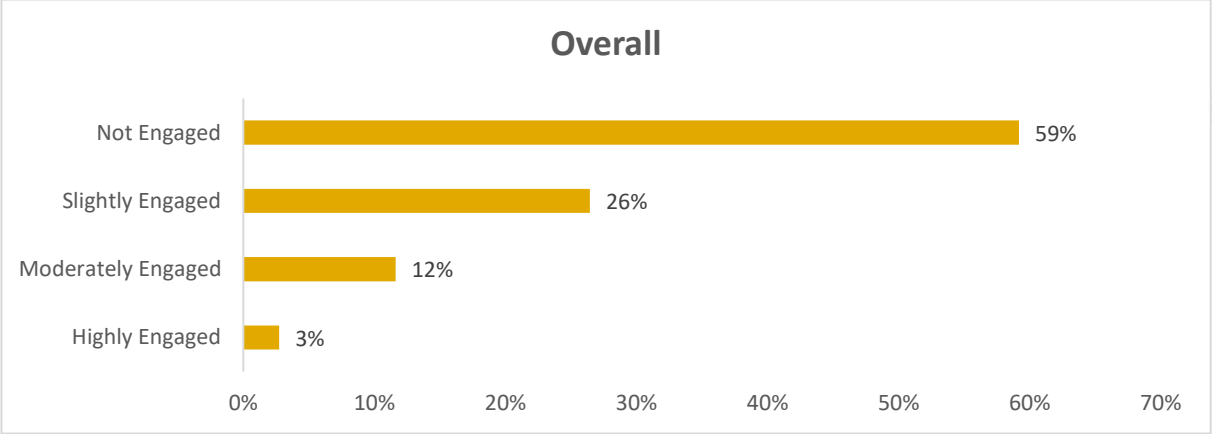
**Summary of Engagement:**

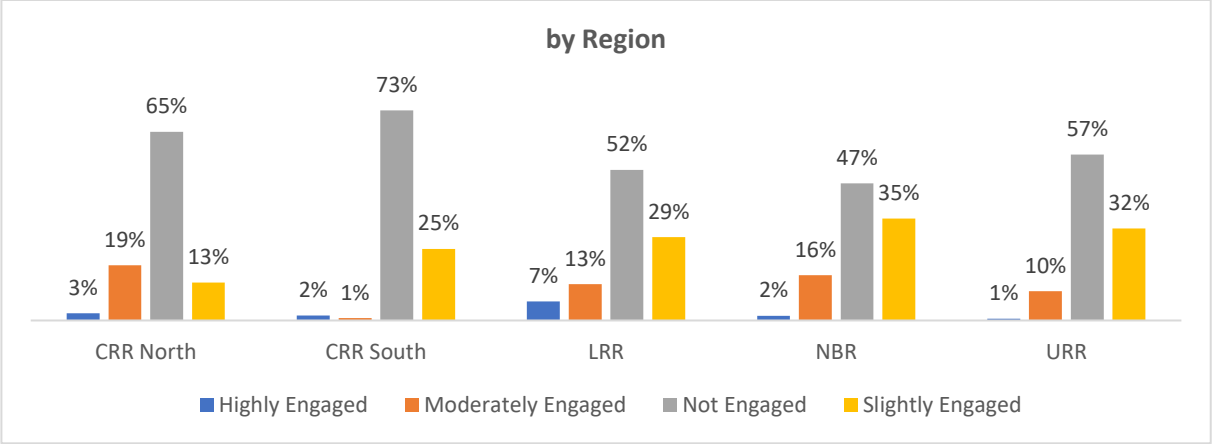
- **Highly Engaged:** 3%
- **Moderately Engaged:** 12%
- **Not Engaged:** 59%
- **Slightly Engaged:** 26%

**Regional Insights:**

- **CRR North: 65%** were "Not Engaged," while only 3% were "Highly Engaged."
- **CRR South: 73%** were "Not Engaged," and engagement was low across all other categories.
- **LRR:** Similar to CRR South, **52%** were "Not Engaged," but **7%** were "Highly Engaged."
- **NBR:** This region had better engagement, with **16% "Moderately Engaged"** and a balanced spread between engagement categories.
- **URR:** Similar to CRR North and South, **57%** were "Not Engaged," with only **1%** being "Highly Engaged."

## Figure 17: Engagement of Journalist in Training of Agroecology






**Conclusion:** **NBR** again displayed better engagement, with **16%** of journalists "Moderately Engaged" in Agroecology training. Overall, most regions, especially **CRR South** and **URR**, saw high levels of disengagement, with **59%** of journalists "Not Engaged" across all regions.

**3. Engagement of Journalists in Organic Fertilizer Training**

**Summary of Engagement:**

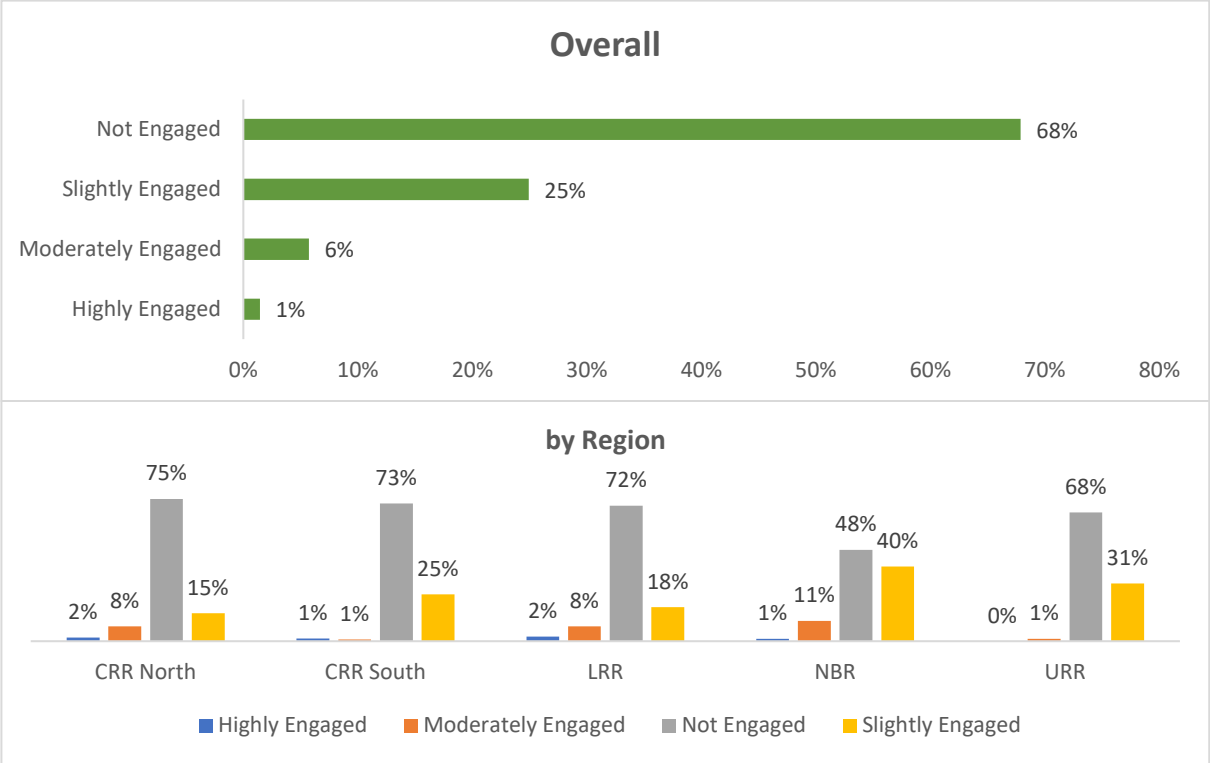
- **Highly Engaged:** 1%
- **Moderately Engaged:** 6%
- **Not Engaged:** 68%
- **Slightly Engaged:** 25%

**Regional Insights:**

- **CRR North: 75%** of journalists were "Not Engaged," with only **2%** being "Highly Engaged."
- **CRR South:** Similarly, **73%** were "Not Engaged," and engagement was low across all other categories.
- **LRR: 72%** of journalists were "Not Engaged," with minimal engagement elsewhere.
- **NBR: 11% "Moderately Engaged,"** and **48%** "Not Engaged," showing slightly better engagement compared to other regions.
- **URR: 68%** of journalists were "Not Engaged," and engagement remained low across the board.

**Conclusion:** Engagement in Organic Fertilizer training was low across all regions, with **NBR** showing the best performance again. Most regions had a high percentage of "Not Engaged" participants, especially **CRR North, CRR South,** and **LRR.**

## Figure 18: Engagement of Journalist in Training of Organic Fertilizer




**Overall Insights Across All Areas**

1. **Best Performing Region:**
    - **NBR** consistently showed the highest levels of engagement across all three datasets, with **20% "Highly Engaged"** in the Circular Economy radio programme, **16% "Moderately Engaged"** in Agroecology training, and **11% "Moderately Engaged"** in Organic Fertilizer training.
2. **Worst Performing Regions:**
    - **CRR North** and **URR** showed consistently low engagement levels. In the Circular Economy radio programme, **72%** of CRR North participants were "Not Engaged," and in Agroecology and Organic Fertilizer training, **65-75%** of journalists were disengaged.
3. **General Disengagement:**
    - Across all regions, there is a pattern of high disengagement, with a combined **47-68%** of participants and journalists in each dataset rating themselves as "Not Engaged." This highlights a need to improve the quality and relevance of these training programs to increase engagement.
4. **Areas of Improvement:**

- **NBR** shows relatively better engagement but still has room for improvement in overall engagement levels.
- Regions like **CRR North, CRR South, LRR,** and **URR** require significant improvements, especially in how these programs are structured and delivered, to ensure higher levels of engagement.

**Remarks**

The data reveals that while **NBR** has better engagement levels, overall there is substantial room for improvement in the quality of the Circular Economy radio programmes and journalist training on Agroecology and Organic Fertilizer production, particularly in regions like **CRR North, CRR South, LRR,** and **URR.** The findings suggest a need for targeted interventions to enhance participation and engagement across these regions.

## C. Challenges in Organic Fertilizer Production

### 2.1: Engage in Organic Fertilizer Production

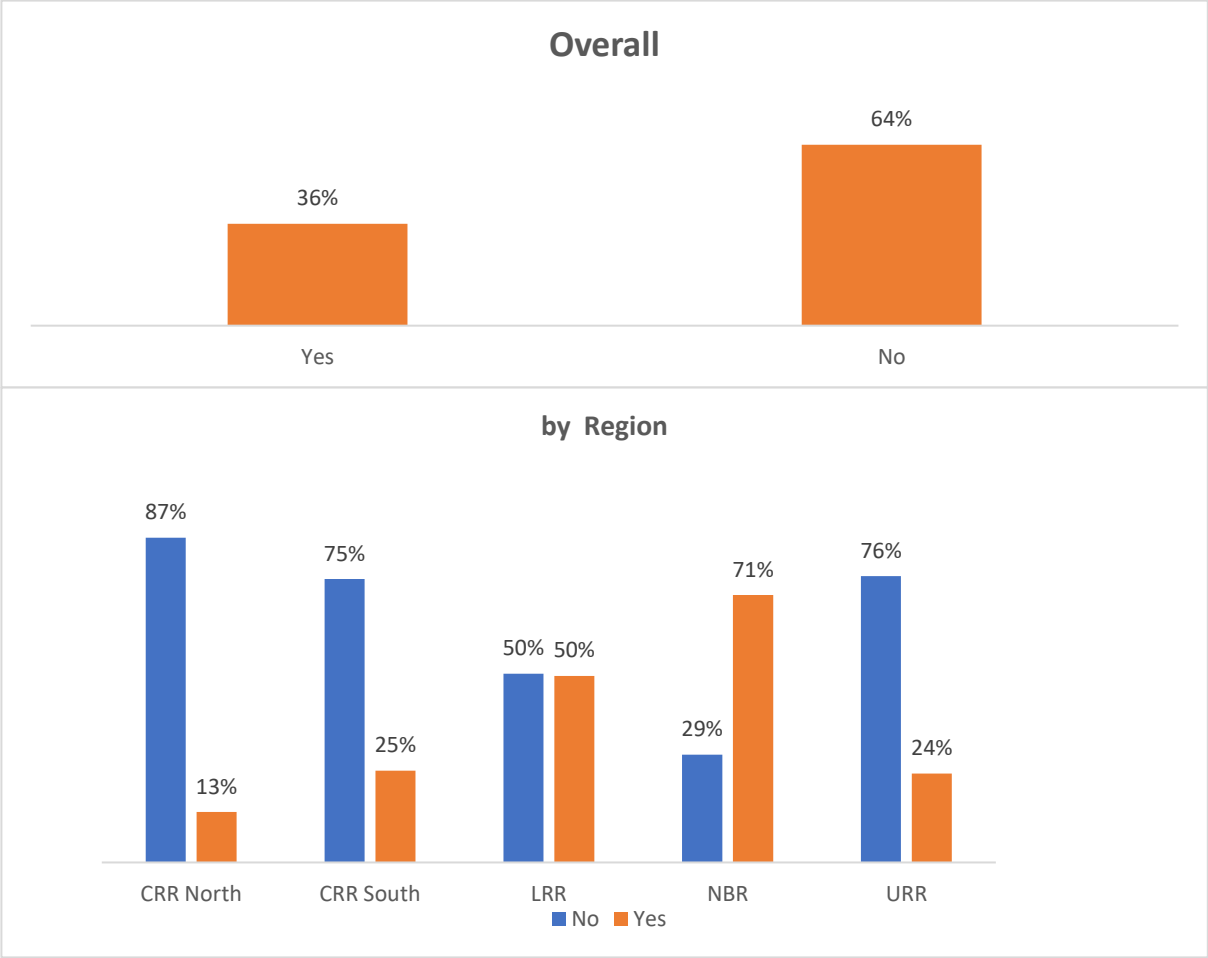
**Engage in organic fertilizer production (overall)**

Figure 19 shows the level of engagement of the respondents on organic fertilizer production for the implementation of agroecology in five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. The overall results revealed that 64% of the respondents are not engaged in organic fertilizer production in their communities, while 36% said they are engaged in organic fertilizer production for the implementation of agroecology in their communities. These findings imply that the amount of organic fertilizer being produced locally by farmers is significantly small to be able to solve the problem of low soil fertility and reduce the usage of chemical fertilizer in the country.

**Regional Comparative Analysis on the Organic Fertilizer Production**

The regional comparative analysis of the respondents' engagement in organic fertilizer production is shown in Figure 2. The results reveal that the highest percentage of the respondents who practice organic fertilizer production are found in CRRN (87%) followed by URR (76%), CRRS (75%) and LRR (50%). The NBR had the lowest percentage of respondents (29%) who are engaged in organic fertiliser production to implement agroecology in their communities. Therefore, the result of the findings implies that the level of organic fertilizer production and usage for implementing agroecology in NBR and URR is significantly lower than in the rest of the regions in the country.

## Figure 19: Engage on Organic Fertilizer Production




## 2.2: Challenges Face in Obtaining Organic Fertilizer Raw material

**Challenges of organic fertilizer raw material (overall)**

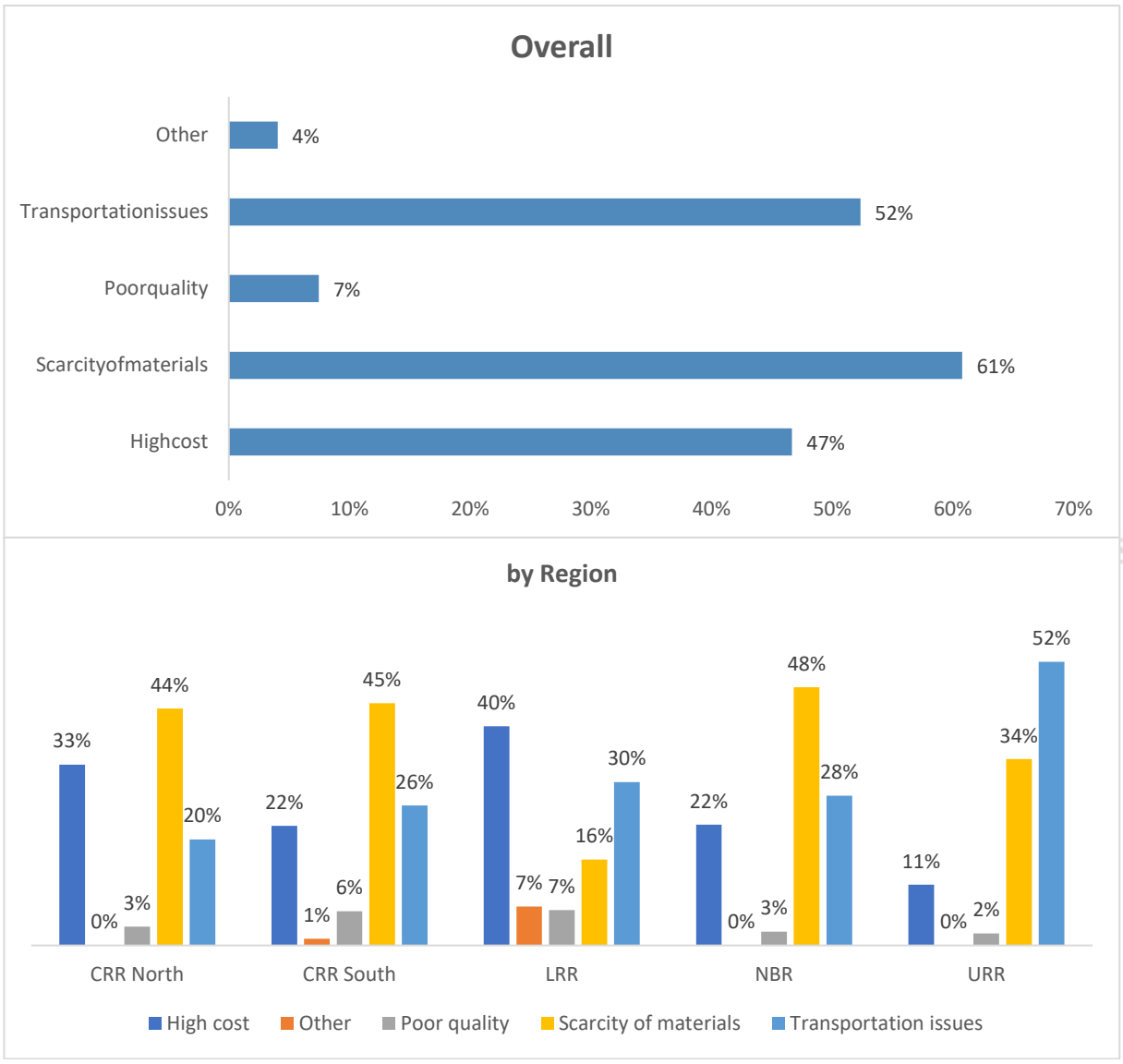
Figure 20 shows the overall challenges in accessing organic fertilizer raw materials for the implementation of agroecological practices in the communities. The majority of the respondents (61%) indicated that raw materials are scarce for the production of organic fertilizer associations in agroecological practices in their communities. However, 52% of them stated transportation issues, while 47% mentioned high cost and 7%, and 4% indicated poor quality and other challenges, respectively as challenges in accessing raw materials for the production of organic fertilizer in agroecological practices in their communities.

**Regional Comparative Analysis on the challenges of organic fertilizer raw material**

Results on the comparative analysis of the challenges of organic fertilizer raw materials for the production of organic fertilizer greatly differ among the regions. Most of the respondents in all the regions indicated scarcity of raw materials as their major challenge in the production of organic

fertility except LRR and URR where most of the respondents stated high cost and transportation issues of raw materials, respectively. The NBR had the highest percentage (48%) of respondents who mentioned scarcity of raw materials availability followed by CRRS (45%) and CRRN (44%). On the other hand, URR recorded the highest percentage (52 %) of the respondents with transportation issues of organic fertilizer raw materials for the production of organic fertilizer followed by LRR (30%) and CRRS (26%). All the regions indicated a very low percentage (not more than 10%) of respondents with poor quality raw materials for the production of organic fertilizer.

## Figure 20: Challenges Face in Obtaining Organic Fertilizer Raw material



## 2.3: Funding situation for organic fertilizer production

**Funding Situation for organic Fertilizer Production (overall)**

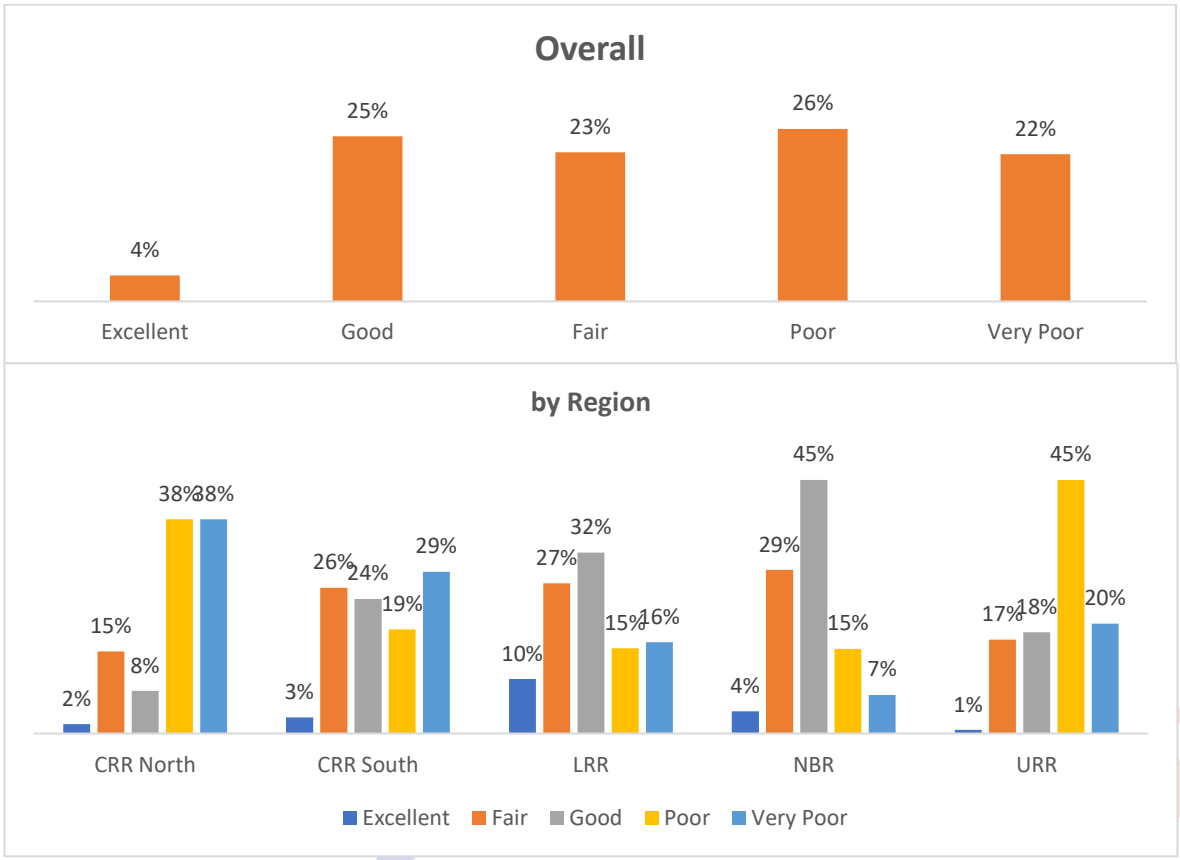
Figure 21 presents the overall funding situation for organic fertilizer production in the context of implementing agroecological practices within communities. A significant portion of respondents (48%) rated the funding as either poor or very poor. Meanwhile, 23% considered the funding to be fair, 25% rated it as good, and only 4% described it as excellent. These results highlight the general perception of insufficient financial support for organic fertilizer production in most communities.

**Regional Comparative Analysis on the challenges of organic fertilizer raw material**

The comparative analysis reveals significant regional variations in the funding challenges for organic fertilizer production. In most regions, respondents predominantly rated the funding situation as either poor or very poor. The Upper River Region (URR) reported the highest dissatisfaction, with 45% of respondents rating funding as poor and 20% as very poor. Similarly, Central River Region (CRR) North recorded 38% in both the poor and very poor categories.

In contrast, the North Bank Region (NBR) stood out with 45% of respondents describing the funding situation as good. The Lower River Region (LRR) and CRR South exhibited a more balanced distribution between positive and negative assessments, reflecting a moderate perception of the funding landscape for organic fertilizer production.

## Figure 21: Funding situation for organic fertilizer production






## 2.4: Structures for the production of organic fertilizers

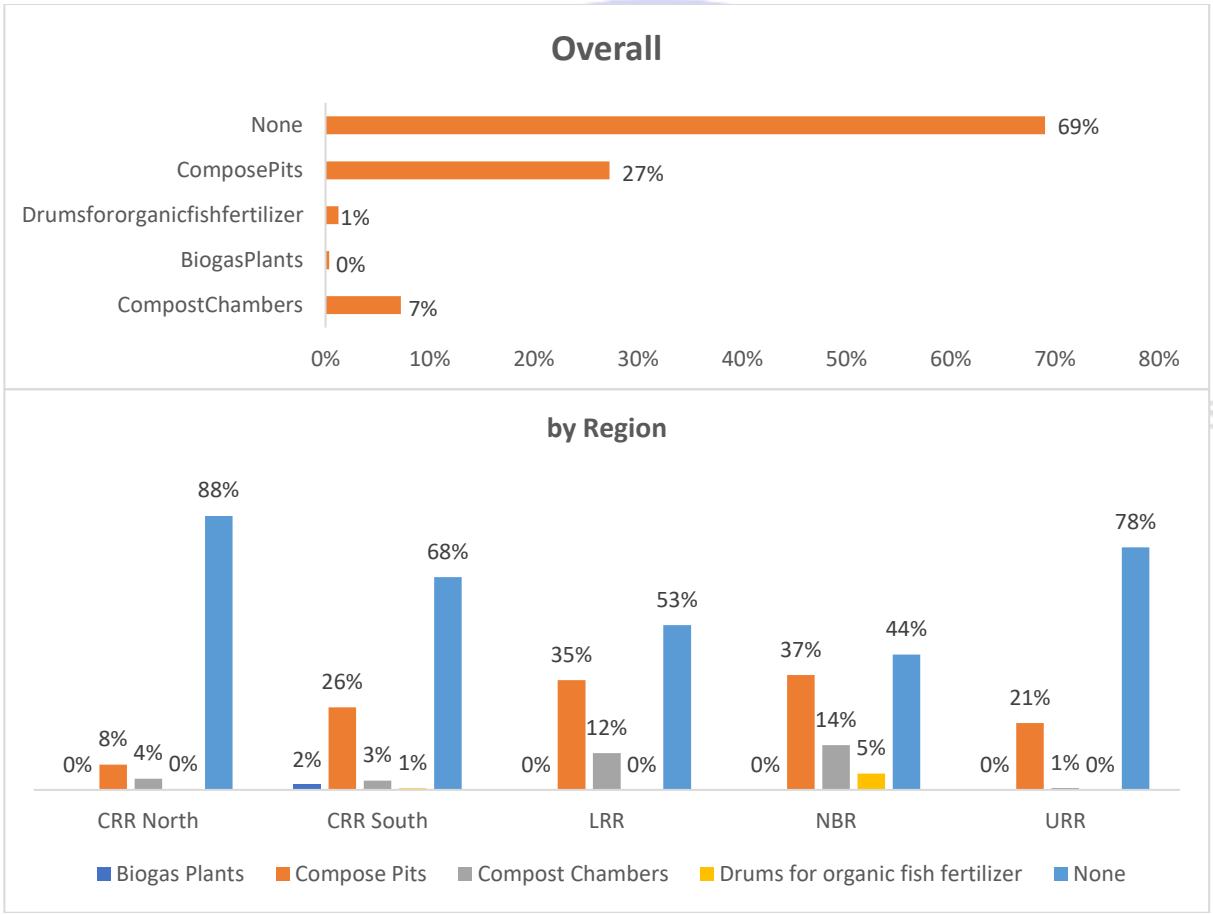
**Structures for the production of organic fertilizers (overall)**

The overall structures for the production of organic fertilizers in the survey areas significantly varied (figure 22). The majority of the respondents (69%) indicated the use of none structures for the production of organic fertilizers, followed by (27%) of the respondents who use compose pits and (7%) of them who used compost chambers as their structures for the production of organic fertilizers. The lowest percentage of the respondents (1%) said that they use drums for organic fish fertilizer. This implies that most of the farmers in the region lack adequate infrastructure for the production of organic fertilizers, which may have caused the low production in the region. It is important to note that the use of organic fertilizers is one of the cornerstones for the effective implementation of agroecological practices. Therefore, without putting these structures in place for adequate organic fertilizer production, most farmer will continue to resort to the application of chemical fertilizers in their farms. putting these structures in place for adequate organic fertilizer production, most farmer will continue to resort to the application of chemical fertilizers in their farms.

**Regional Comparative Analysis on the** structures for the production of organic fertilizers

Figure 22 below reports diagnostic study results on the Regional Comparative Analysis of structures for the production of organic fertilizers in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Most of the respondents in all the regions stated the use of no structures for the production of organic fertilizers. The CRRN had the highest percentage (88%) of respondents who mentioned the use of no structures for the production of organic fertilizers followed by URR (78%) and CRRS (68%). On the other hand, NBR recorded the highest percentage (37%) of the respondents with the use of compose pit as their structures for the production of organic fertilizers followed by LRR (35%) and CRRS (26%). All the regions indicated a very low percentage (not more than 5%) of respondents with the use of biogas plants. The use of drums for organic fish fertilizer production was only observed in NBR (5%) and not practised in other regions.

## Figure 22: Structures for the production of organic fertilizers



## 2.5: Challenges in accessing tools and equipment for organic fertilizer production

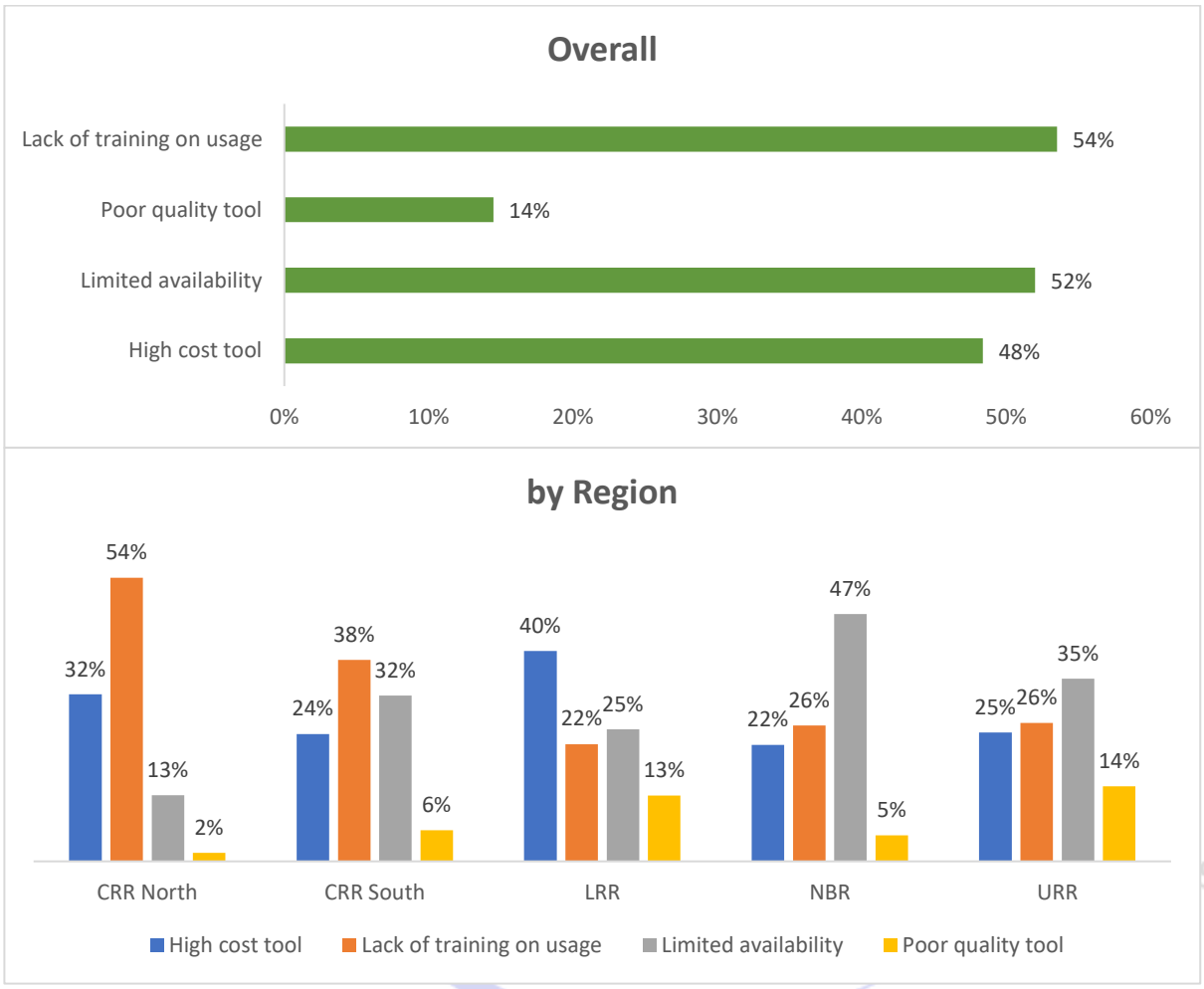
**Challenges in accessing tools and equipment for organic fertilizer production (overall)**

The overall challenges in accessing tools and equipment for organic fertilizer production in the survey areas is presented in Figure 23. The major challenges outlined by the respondents in accessing tools and equipment for organic fertilizer production are lack of training on usage, poor quality tools, limited availability of tools and high cost of tools and equipment. The majority of the respondents (54%) indicated lack of training on the use of tools and equipment as their main limitation for organic fertilizer production, while 52% of them mentioned limited availability and 48% stated high cost of tools as their major challenge for the production of organic fertilizer. The lowest percentage of the respondents (14%) said that poor quality of tools is their major challenge.

**Regional Comparative Analysis on the** challenges in accessing tools and equipment for organic fertilizer production

Figure 23 shows diagnostic study results on the Regional Comparative Analysis of the challenges in accessing tools and equipment for organic fertilizer production in five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. The CRRN had the highest percentage (54%) of respondents who mentioned a lack of training in accessing organic fertilizer production tools and equipment followed by CRRS (38%) and NBR & URR (26%). On the other hand, NBR recorded the highest percentage (47%) of the respondents with limited availability of tools and equipment for the production of organic fertilizer followed by URR (35%) and CRRS (32%). Most of the respondents in LRR (40%) complained of the high cost of organic fertilizer production tools and equipment as their major limitation. All the regions indicated a very low percentage (not more than 15%) of respondents with poor quality of tools and equipment for the production of organic fertilizer.

**Figure 23: Challenges in accessing tools and equipment for organic fertilizer production**



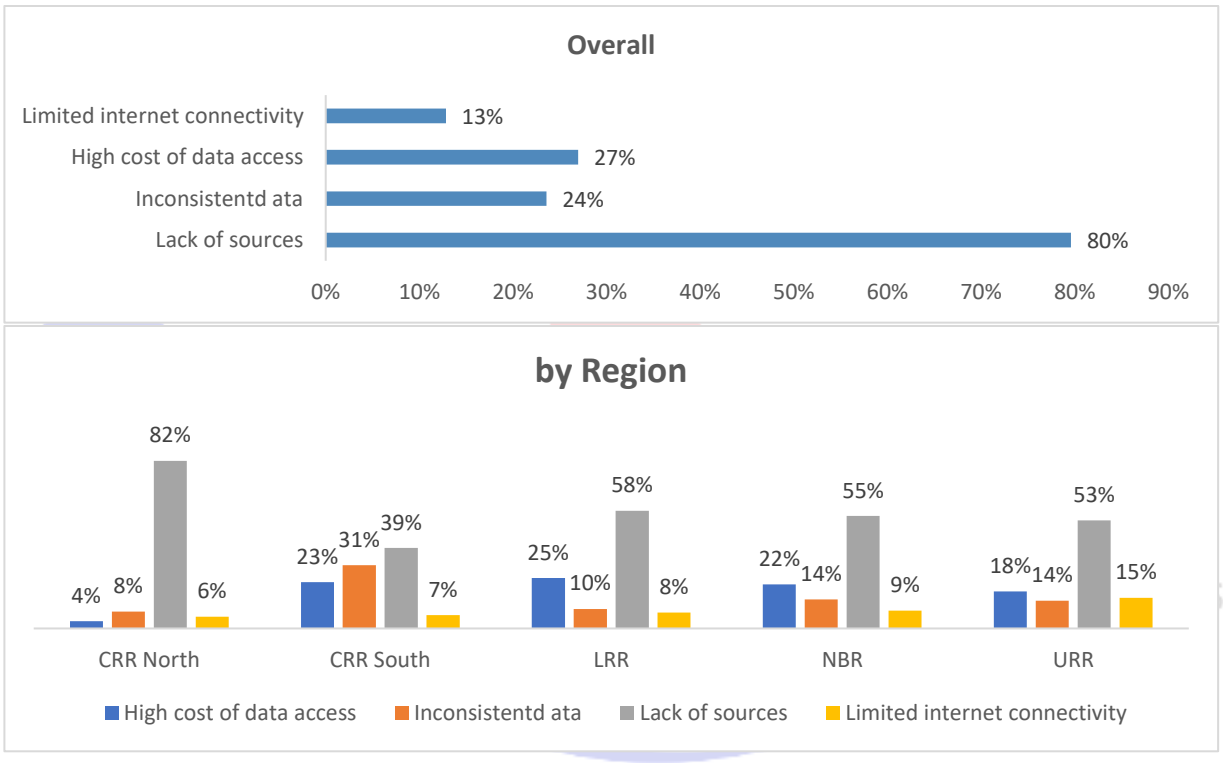

## 2.6: Accessing information and data on the production of organic Usage

The overall results of accessing information and data on the production and usage of organic fertilizer in the survey areas are presented in Figure 24. The majority of the respondents (80%) stated lack of sources as their major constraint in accessing information and data on the production of organic fertilizer, followed by 27% of the respondents who indicated high cost as their main limitation and 24% of them stated inconsistency of data as their major challenge in accessing information and data on the production of organic. The lowest percentage of the respondents (13%) mentioned limited internet connectivity as their major challenge of organic fertilizer.

The result shows significant variation in accessing information and data on the production of organic fertilizer amongst the regions. Most of the respondents in all the regions indicated a lack of sources of information and data on the production and usage of organic fertilizer in all the

regions. The CRR had the highest percentage (82%) of respondents who mentioned a lack of sources of information followed by LRR (58%) and NBR (55%). The CRRS recorded the lowest percentage of respondents (39%) as compared to other regions who stated lack of source as their major constraint in accessing information and data on the production and usage of organic. Similarly, the high cost of data access was indicated by the respondents in the region as one of their constraints. The LRR was found to be highly affected (25%) by the high cost of data than all the other regions followed by CRR (23%), NBR (22%) and URR (18%). The limited internet connectivity was observed as the least (not more than 15%) affected constraint in all the regions.

**Figure 24: Accessing information and data on the production of organic Usage**




## 2.7: Accessing information and data on the production of organic fertilizer

The data on accessing information and data on organic fertilizer production highlights several key barriers both overall and regionally:

**Overall Analysis:**

The most significant challenge faced by respondents in accessing information on organic fertilizer production is a **lack of sources**, with a notable **70%** indicating this as their primary issue. This suggests that information on organic fertilizer production is either unavailable or inaccessible to the majority of respondents.

**The high cost of data access** comes second at **13%**, indicating that while data might be available, accessing it is often prohibitively expensive for some individuals. Additionally, **inconsistent data**

(9%) and **limited internet connectivity** (7%) are also noted as barriers but to a lesser extent compared to the lack of available sources.

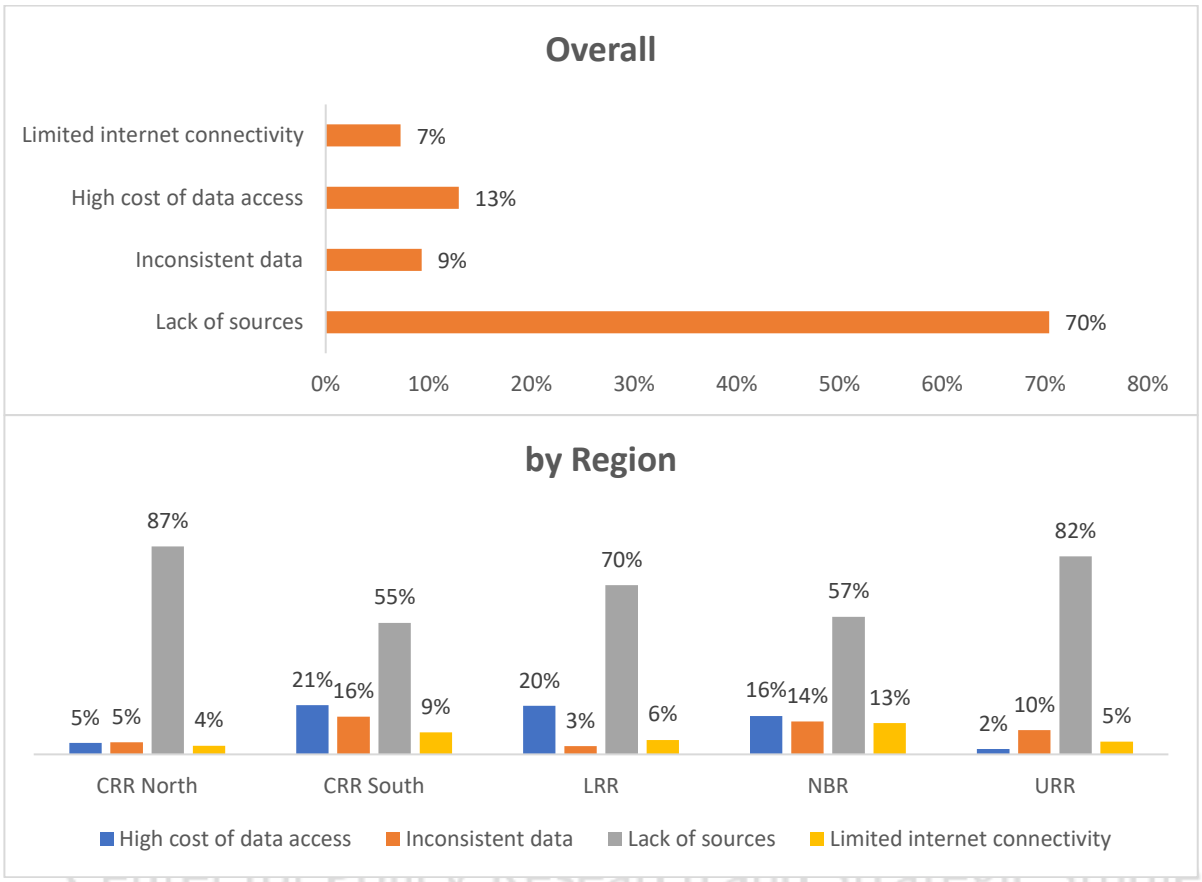
**Regional Analysis:**

- **CRR North**: The overwhelming majority (87%) indicated **lack of sources** as the biggest challenge in accessing information, with other factors such as **inconsistent data** (5%), **high cost of data** (5%), and **limited internet connectivity** (4%) posing only minor concerns.
- **CRR South**: A similar trend is observed with **lack of sources** being a significant challenge (55%). However, compared to other regions, **high data costs** (21%) and **inconsistent data** (16%) are relatively higher concerns here.
- **LRR**: **Lack of sources** (70%) remains the most reported challenge, with **high cost of data** (20%) following. Other issues, such as **limited internet connectivity** (6%) and **inconsistent data** (3%), are less concerning.
- **NBR**: While **lack of sources** remains a major challenge (57%), **high cost of data** (16%) and **inconsistent data** (14%) are also reported at higher levels than in other regions. **Limited internet connectivity** is less of an issue at only 13%.
- **URR**: This region has the highest percentage (82%) reporting **lack of sources** as their biggest issue. Additionally, **high cost of data** (10%) and **inconsistent data** (5%) are noted, while **limited internet connectivity** (2%) is the least concerning factor here.

**Conclusion:**

Across all regions, the primary challenge remains the **lack of available sources** of organic fertilizer production. However, the **high cost of data** and **inconsistent data** are more prominent issues in regions like CRR South, LRR, and NBR. Addressing these barriers will require improving access to relevant resources and potentially subsidizing the cost of data access to make information more widely available

**Figure 25: Accessing information and data on the production of organic fertilizer**






## 2.8: Access organic fertilizers from agricultural markets

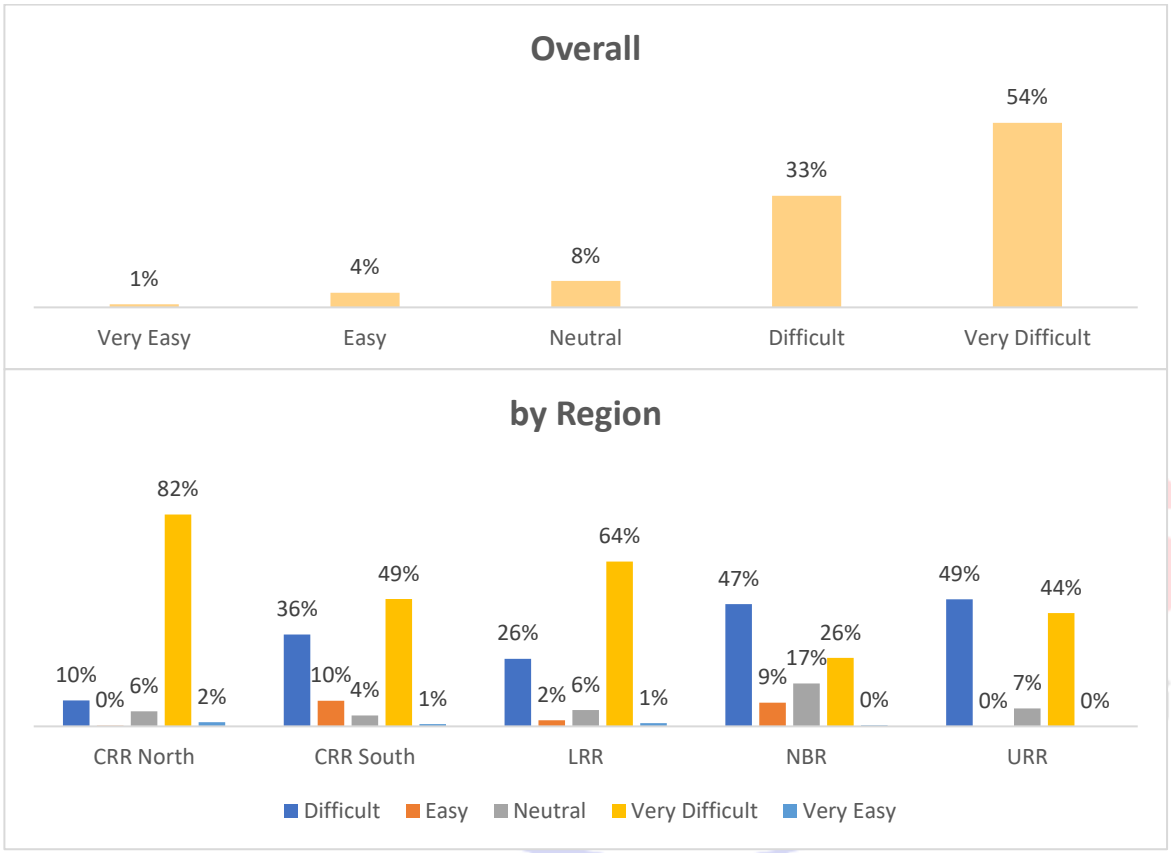
The availability and number of adequate agricultural markets are key influential factors and determinants for access to agroecological products in the communities. The majority of the respondents (54%) indicated that access to organic fertilizer from the agricultural market is very difficult, followed by (33) of the respondents who stated access to organic fertilizers from markets as difficult and (8%) of them were neutral. The lowest percentage of the respondents (1%) said that it is very easy to access the agricultural market to procure organic fertilizer.

**Regional Comparative Analysis on** access organic fertilizers from agricultural markets

Comparative analysis was carried out to determine the perception of the respondents in the study area on the access to organic fertilizer from agricultural markets for the procurement of agroecological products in the various regions (Figure 4.12). The result shows that the markets for access to agroecological products in all the survey regions are not adequate. The majority of respondents in CRRN (82%), LRR (64%), CRRS (49%) and URR (44%) stated that the markets for accessing the agricultural market to procure organic fertilizer are very difficult in their communities. While 26% of them in NBR indicated that the markets for accessing the agricultural

market to procure organic fertilizer are very difficult in the region. However, a significant percentage of respondents in CRRS (10%) and NBR (9%) mentioned that the markets for accessing the agricultural market to procure organic fertilizer are easy compared to other regions. Similarly, only CRRN (2%) and LRR (1%) indicated the markets for accessing the agricultural market to procure organic fertilizer is very easy in their communities.

**Figure 26: Access organic fertilizers from agricultural markets**




## 2.9: Constraints face in receiving support and supplies for organic fertilizer production

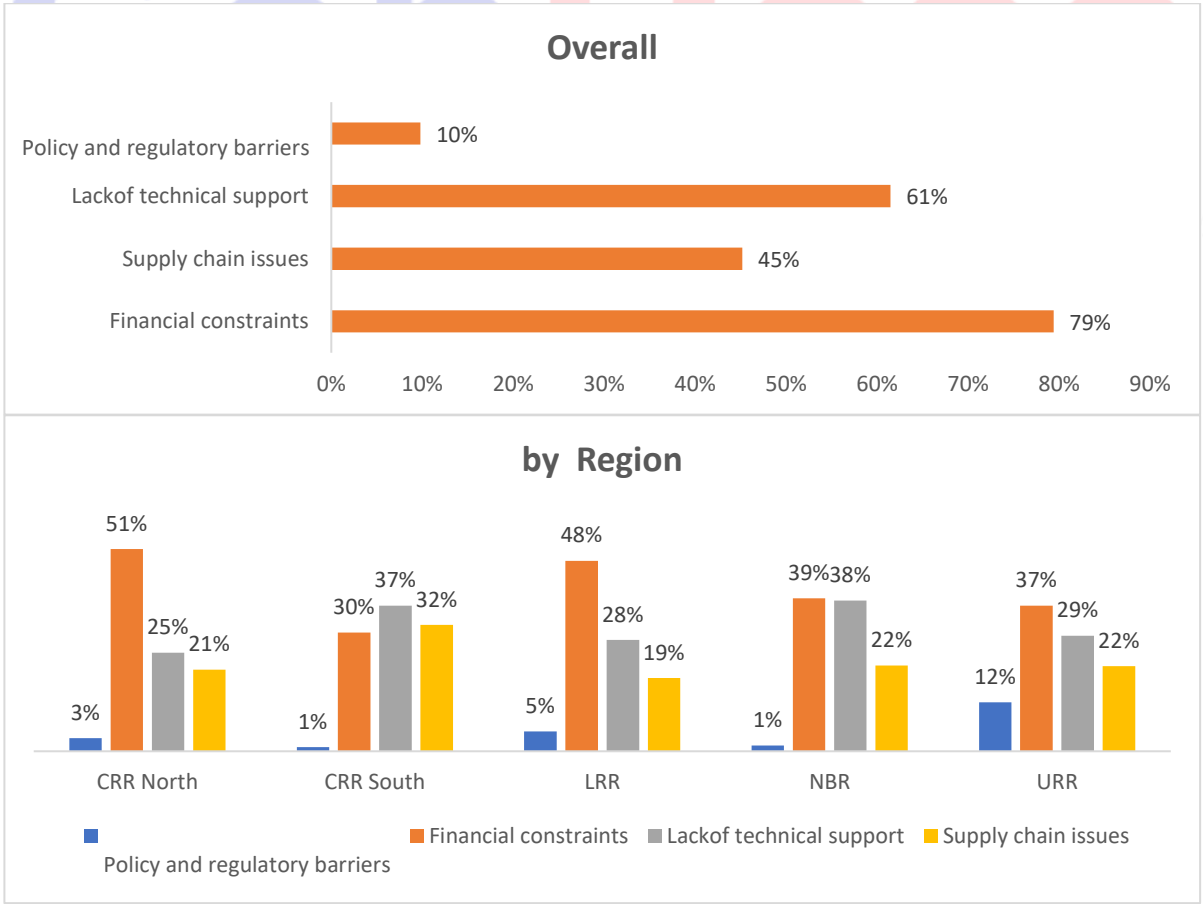
Farmers, especially vegetable growers practice organic fertilizer production to improve the soil fertility status and yield of crops in the farmlands. However, the quantity of organic fertilizer produced locally is highly insignificant due to major challenges affecting farmers in the production value chain. The overall study results on the constraints faced by farmers in receiving support and supplies for the production of organic fertilizer are shown in Figure 27. The results indicated that most of the respondents in the study area stated financial constraint (79%) as the major factor limiting the production of organic fertilizers in the communities followed by lack of technical support (61%) and supply chain issues (45%). The policy and regulatory barriers were mentioned

by the respondents as a minor constraint affecting the production of organic fertilizers in the regions.

**Regional Comparative Analysis** on Constraints face in Receiving Support and Supplies for Organic Fertilizer Production

The constraints faced in receiving support and supplies for organic fertilizer by region are presented in Figure 27. The various constraints outlined by the respondents were financial constraints, lack of technical support, supply chain issues and policy and regulatory barriers. The majority of the respondents in all the regions except CRRS indicated financial constraint as their main challenge in the production of organic. The highest percentage of the respondents (51%) who stated financial constraints as their major challenge was recorded in CRRN followed by LRR (48%), NBR (39%) and URR (37%). For CRRS, most of the respondents mentioned a lack of technical support as their main constraint in the production of organic fertilizer. The supply chain issues were stated as the third major constraint and this was mostly highlighted in CRRS (32%) than all the other regions followed by NBR and URR (22%), CRRN (21%) and LRR (19%). The policy and regulatory barriers were indicated as the least constraint affecting the production of organic fertilizers in the regions.

**Figure 27: Constraints face in receiving support and supplies for organic fertilizer production**



## 2.10: Availability of information on recommended standards for the production of organic fertilizers

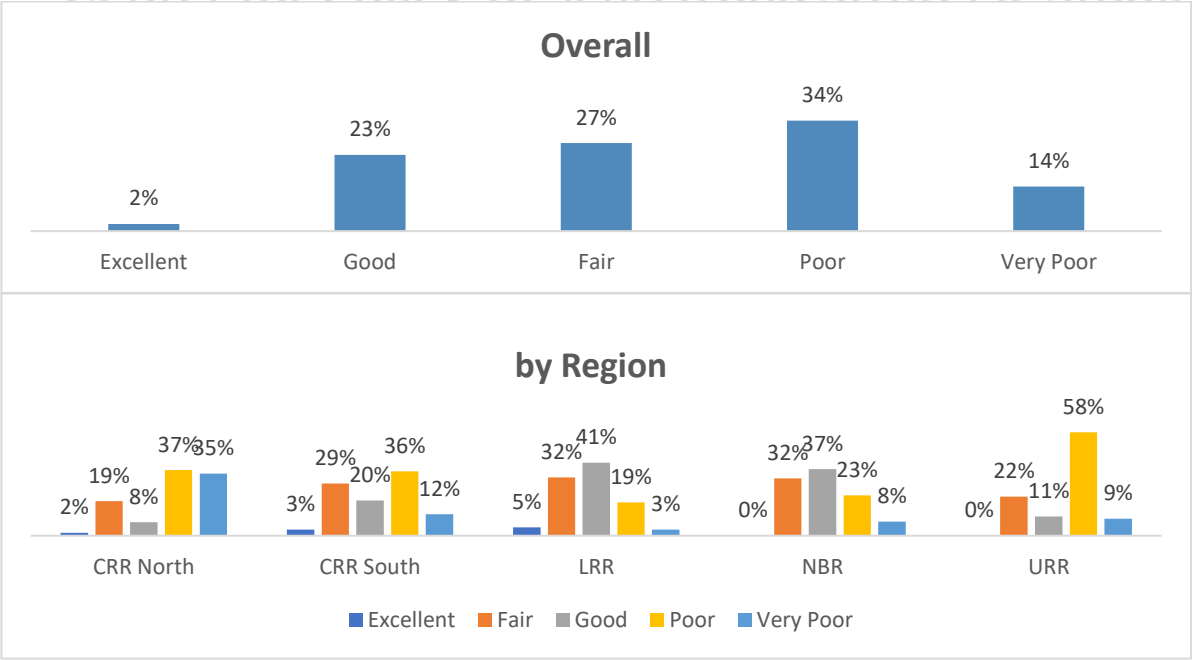
The availability of information on recommended standards for the production of organic fertilizer in the survey areas significantly varied (Figure 28). The majority of the respondents (34%) indicated that the availability of information on recommended standards for organic fertilizer production is poor, followed by 27% of the respondents who mentioned that the information availability is fair and 23% of them stated that is good. The lowest percentage of the respondents (2%) said that the information source on recommended standards for organic fertilizer production is excellent.

**Regional Comparative Analysis on availability of information recommended standards for the production of organic fertilizer**

The result of the comparative analysis of the availability of information on the recommended standards for organic fertilizer production greatly differs amongst the regions. Most of the respondents in all the regions indicated poor availability of information on the recommended standards except LRR and NBR where most of the respondents stated good availability of information. The URR had the highest percentage (58%) of respondents who mentioned poor availability of information followed by CRRN (37%) and CRRS (36%). On the other hand, CRRN recorded the highest percentage (34 %) of the respondents with very poor source information on recommended organic fertilizer production standards followed by CRRS (12%) and URR (9%). All the regions indicated a very low percentage (not more than 5%) of respondents with excellent availability of information on organic fertilizer recommended standards

**Figure 28: Availability of information on recommended standards for the production of organic fertilizers**





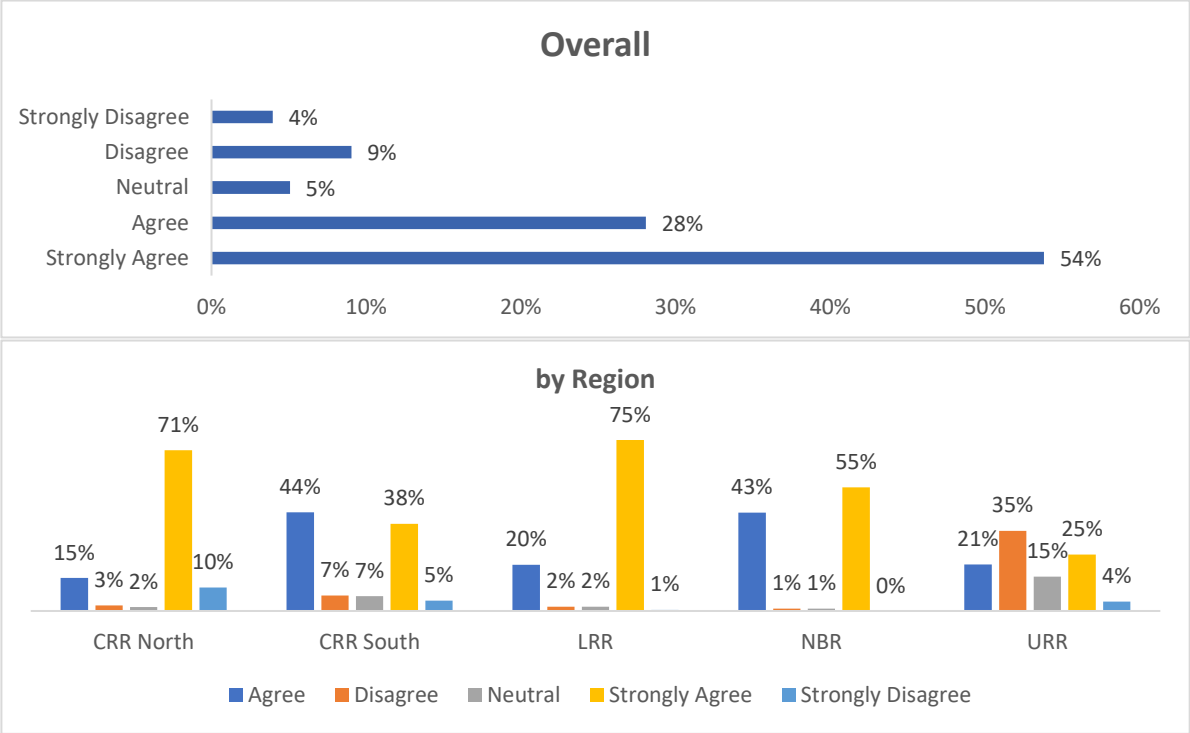
## 2.11: An increase in the cost of chemical fertilizers led to higher production and usage

Chemical fertilizers are widely used by most of the farmers during the production of crops in the Gambia. The results on the perception of the respondents on the effect of cost increase in chemical fertilizers on their level of usage and production of crops are shown in Figure 29. Overall, most of the respondents (54%) in the study regions strongly agreed that an increase in the cost of chemical fertilizer led to higher production of crops and usage of fertilizer, while 28% of the respondents agreed that the cost increase of chemical fertilizer led to higher usage and level of crop production. On the contrary, 9% of them disagreed and 4% strongly disagreed that an increase in the cost of chemical fertilizers led to higher production of crops and fertilizer usage.

**Regional Comparative Analysis on increase in the cost of chemical fertilizers led to higher production and usage**

The regional comparative analysis of the perception of the respondents on the effect of the cost of chemical fertilizers on the level of usage and production of crops is presented in Figure 18. The majority of the respondents in CRRN (71%), LRR (75%) and NBR (55%) strongly agreed that an increase in the cost of chemical fertilizer led to a higher level of usage and production of crops. Also, most of the respondents in CRRS (44%) followed by NBR (43%) URR (21%) LRR (20%) and CRRN (15%) agreed that an increase in the cost of chemical fertilizers led to higher usage and level of production of crops. However, in URR most of the respondents (35%) disagreed that an increase in the cost of chemical fertilizers did not have any influence on the level of usage and production of crops. Similarly, there are small percentage of the respondents in the regions who strongly disagree that an increase in the cost of chemical fertilizer led to a higher level of usage and crop production with the highest recorded in CRRN (10%) followed by CRRS (5%) and URR (4%).

## Figure 29: An increase in the cost of chemical fertilizers led to higher production and use




## 2.12: Challenges do you face in accessing research technologies on organic fertilizer usage



The most prominent challenge reported is a lack of information, affecting 64% of respondents. This indicates a widespread need for better education and outreach concerning organic fertilizer technologies. Another key issue is limited local availability (41%), highlighting supply chain and distribution gaps that hinder access to necessary tools and materials. Technological complexity is also a concern for 33% of respondents, suggesting that some users find the available technologies difficult to understand or use. Additionally, high costs were cited by 26%, though this issue is less pronounced than the others. Only 5% of respondents reported no significant challenges, suggesting that most individuals face at least one barrier in accessing these technologies.

**Regional Comparative Analysis of the Challenges you face in assessing research technologies on organic fertilizer usage**

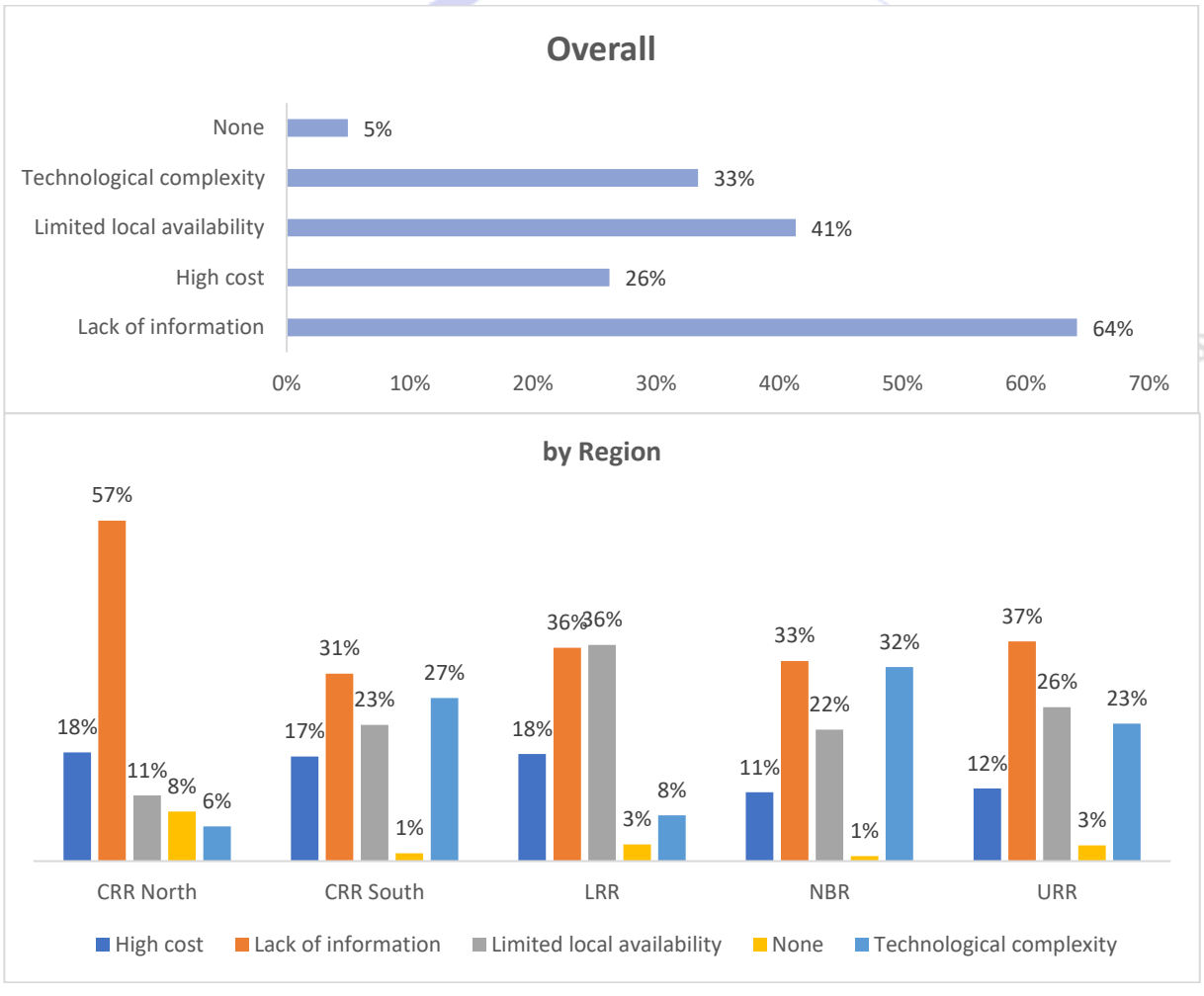
**Regional Breakdown:**

- **CRR North** faces substantial challenges, with lack of information being the dominant issue for 57% of respondents. High costs (18%) and limited local availability (11%) are also concerns, though technological complexity is less of an issue.
- **CRR South** also struggles with a lack of information (31%) and limited local availability (23%), with high costs (17%) playing a role, albeit to a lesser extent. Technological complexity remains low.

- **In LRR,** limited local availability (36%) is the most significant challenge, followed by lack of information (27%). High costs (18%) and technological complexity (6%) are less pronounced but still relevant.
- **NBR** respondents report challenges related to lack of information (33%) and limited local availability (22%). High costs (11%) and technological complexity (1%) are minimal concerns here.
- **URR** experiences a combination of barriers, with lack of information (37%) being the primary issue, followed by high costs (26%) and limited local availability (23%).

In summary, the main challenges across all regions are related to the lack of information and limited local availability of organic fertilizer technologies, with some regions also experiencing notable concerns over high costs. Addressing these gaps through improved education, outreach, and better distribution systems could significantly enhance the adoption and usage of organic fertilizer technologies.

## Figure 30: Challenges do you face in accessing research technologies on organic fertilizer usage



## 2.13: Challenges do you face in accessing research technologies on organic fertilizer production

The figure provides an analysis of the challenges faced in accessing organic fertilizer technologies, highlighting barriers like high costs, lack of information, limited local availability, and technological complexity, both overall and by region.

**Overall Analysis:**

- **Lack of Information (38%)** is the most significant challenge, reflecting a widespread need for better awareness and communication around organic fertilizer technologies.
- **Limited Local Availability (24%)** ranks second, suggesting access issues, where the required technology or tools may not be available locally.
- **Technological Complexity (20%)** is also notable, indicating that a considerable portion of respondents find these technologies difficult to understand or use.
- **High Costs (15%)** are a challenge, though less significant compared to other factors.
- Only **3%** of respondents indicated no barriers, meaning the majority face at least one challenge in accessing these technologies.

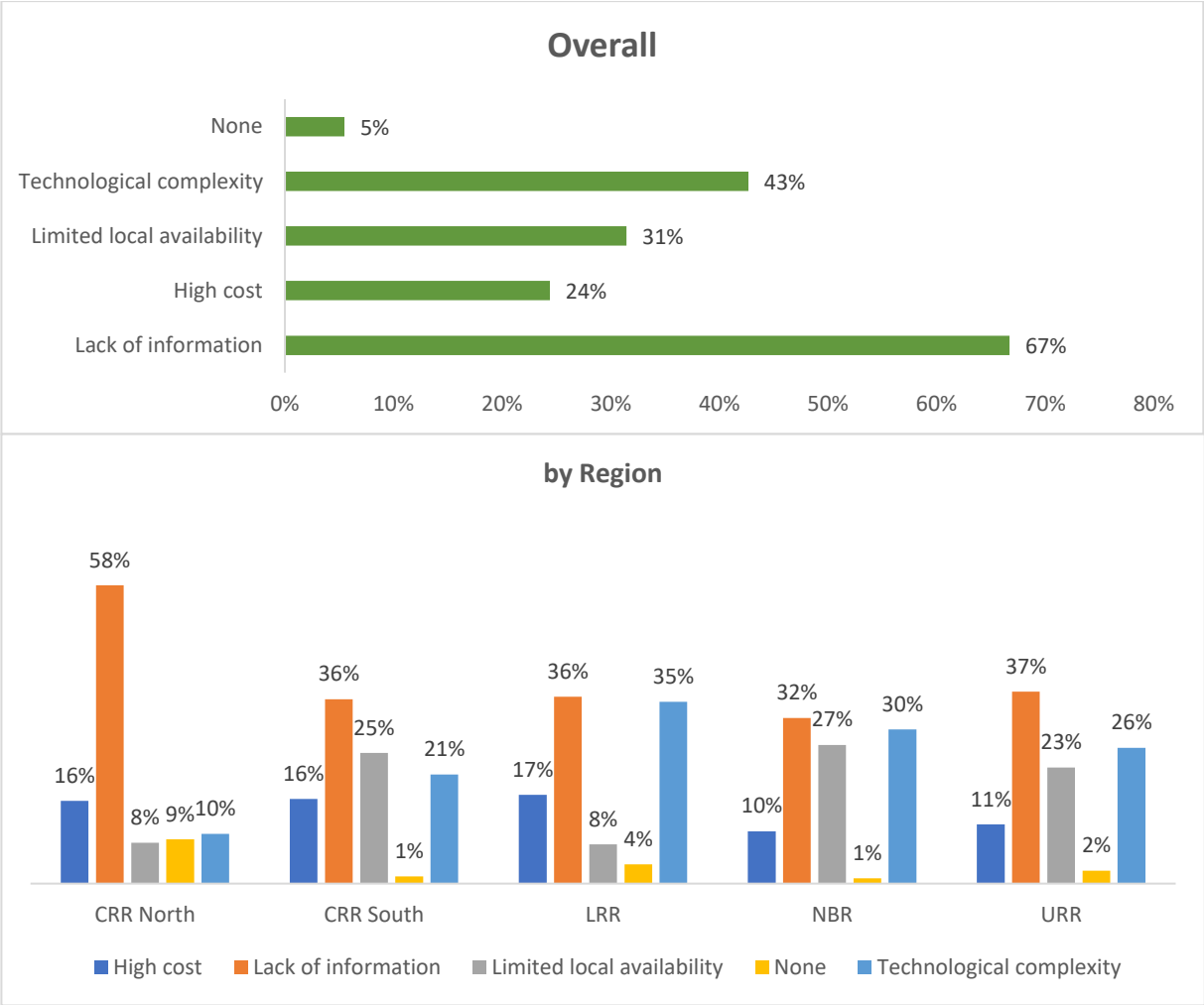
**Regional Analysis:**

- **CRR North**: The biggest barrier here is **lack of information (57%)**, while **high cost (18%)** and **limited local availability (11%)** are lesser concerns. **Technological complexity** (6%) is among the lowest in this region, suggesting that understanding the technology is not a primary issue.
- **CRR South**: Here, **lack of information (31%)** remains a major issue but less dominant compared to other regions. **Limited local availability (23%)** and **technological complexity (27%)** are more prominent, showing that both access to technology and its complexity pose challenges in this region.
- **LRR**: The region shows an equal share of challenges from **lack of information (36%)** and **limited local availability (36%)**, indicating that both awareness and access are major issues. **High cost (18%)** and **technological complexity (8%)** are relatively lower but still important factors.
- **NBR**: **Lack of information (33%)** is the primary challenge, though **technological complexity (32%)** is unusually high here compared to other regions, indicating that respondents may struggle to use or understand the available technology. **Limited local availability (22%)** and **high cost (11%)** are less significant barriers.
- **URR**: **Lack of information (37%)** is the top challenge, while **technological complexity (23%)** and **limited local availability (26%)** are also reported concerns. **High cost (12%)** plays a lesser role but still affects respondents in this region.

Across all regions, **lack of information** is the dominant challenge, especially in CRR North, LRR, and URR, where it surpasses 35%. **Limited local availability** also presents a major hurdle,

particularly in LRR and URR. The issue of **technological complexity** varies across regions, being a notable concern in NBR and CRR South. **High cost** is a moderate concern overall but is less of an issue compared to other factors. Addressing these barriers would involve improving information dissemination, making technology more accessible, and simplifying its usage to encourage adoption.

## Figure 31: Challenges do you face in accessing research technologies on organic fertilizer production



## 2.14 RECOMMENDATIONS:

### Engage in Organic Fertilizer Production

The results reveal that the highest percentage of the respondents who practice organic fertilizer production are found in CRRN (87%) followed by URR (76%), CRRS (75%) and LRR (50%).

Intervention initiatives are highly recommended for the NBR because the lowest (29%) engagement by respondents was in NBR. Recommendations for initiatives will address the gap in engagement in implementing agroecology practices and the production of organic fertilizers in NBR. Similarly, because in LRR the findings showed that (50%), one-half of respondents are engaged in organic fertilizer production, it is also recommended that initiatives be considered for increasing the number of persons engaged in organic fertilizer production. One-half (50%) is cause for concern where this engagement may slide backward if intervention efforts are not directed at these regions. Thus, all efforts of intervention actions such as sensitization, education, and facilitation and creation of sample farms would help to increase the engagement in both NRB and LRR.

### Challenges of organic fertilizer raw material (overall)

Results on the comparative analysis of the challenges of organic fertilizer raw materials for the production of organic fertilizer greatly differ among the regions. Most of the respondents in all the regions indicated scarcity of raw materials as their major challenge in the production of organic fertility except LRR and URR where most of the respondents stated high cost and transportation issues of raw materials, respectively. The NBR had the highest percentage (48%) of respondents who mentioned scarcity of raw materials availability followed by CRRS (45%) and CRRN (44%). All the regions indicated a very low percentage (not more than 10%) of respondents with poor quality raw materials for the production of organic fertilizer.

Based on the findings, it is highly recommended that intervention efforts be directed at NBR and CRR-North and South that would ameliorate the challenge of sourcing raw materials for the production of organic fertilizers. This effort may be provided in the form of educating the farmers on green innovations that involve green products (fertilizer) and green systems (methods) of production. This would educate on identifying the proper material as the most suitable raw material that can be sourced and used for the production of organic fertilizers. The proper experts with pertinent knowledge in this area should be the in mix of solutions in addressing finding and using raw materials for the production and use of organic fertilizers.

On the other hand, URR recorded the highest percentage (52%) of the respondents with transportation issues of production of organic fertilizer followed by LRR (30%) and CRRS (26%). Thus, it is highly recommended that intervention efforts to address transportation issues include the provision of affordable transportation. Because many of these farmers are of low means, simple and affordable means of transportation would address the challenges with limited or low-cost means. Thus, it is recommended farmers are helped to access funds for the purchase of simple,

low-cost modes of transport in the form of donkeys and carts that may be offered as grants or soft loans.

### Funding Situation for organic Fertilizer Production (overall)

The comparative analysis reveals significant regional variations in the funding challenges for organic fertilizer production. In most regions, respondents predominantly rated the funding situation as either poor or very poor. The URR reported the highest dissatisfaction, with 45% of respondents rating funding as poor and 20% as very poor. Similarly, CRR-North recorded 38% in both the poor and very poor categories.

In contrast, the NBR stood out with 45% of respondents describing the funding situation as good. The LRR and CRR South exhibited a more balanced distribution between positive and negative assessments, reflecting a moderate perception of the funding landscape for organic fertilizer production.

Based on the findings, it is highly recommended for intervention efforts to address matters of the funding gap in URR and CRR-North; the regions with critical situations of funding gaps in the production and use of organic fertilizer. The same recommendation may be suitable for NBR and LRR. Funding may be provided in the form of a low-interest loan or as a form of agricultural subsidy. An agricultural cooperative may also be created to among other things assist in facilitating funding schemes to increase the accessibility of funds towards agroecological practices and for the production and use of organic fertilizers.



### Structures for the production of organic fertilizers (overall)

The findings showed that most respondents in all the regions stated the use of no structures for the production of organic fertilizers. The CRR-N had the highest percentage (88%) of respondents who mentioned the use of no structures for the production of organic fertilizers followed by URR (78%) and CRR-S (68%).

On the other hand, NBR recorded the highest percentage (37%) of the respondents with the use of compose pit as their structures for the production of organic fertilizers followed by LRR (35%) and CRR-S (26%).

All the regions indicated a very low percentage (not more than 5%) of respondents with the use of biogas plants. The use of drums for organic fish fertilizer production was only observed in NBR (5%) and not practiced in other regions. Thus, it is highly recommended intervention efforts are directed at CRR-North and South, and URR, to address the challenge. It is recommended that these regions receive expert training to understand how to use the various forms of structures for the production and use of organic fertilizer. While NBR, LRR, and CRR-S showed some form of understanding for the use of one form or other structure in the production of organic fertilizer, it may similarly be recommended for continuous improvement that these regions continue to receive training on the structures they are knowledgeable about. An added understanding of other forms

of structure will add value to the farmers. Thus it is recommended for these regions to receive training on the structure they are not knowledgeable about and may want to diversify their structure.

**Challenges in accessing tools and equipment for organic fertilizer production (overall)**

The findings showed The CRR-N had the highest percentage (54%) of respondents who mentioned a lack of training in accessing organic fertilizer production tools and equipment followed by CRR-S (38%) and NBR & URR (26%).

On the other hand, NBR recorded the highest percentage (47%) of the respondents with limited availability of tools and equipment for the production of organic fertilizer followed by URR (35%) and CRR-S (32%).

Most of the respondents in LRR (40%) complained of the high cost of organic fertilizer production tools and equipment as their major limitation.

All the regions indicated a very low percentage (not more than 15%) of respondents with poor quality of tools and equipment for the production of organic fertilizer.

Based on the findings, it is recommended that intervention efforts for URR, CRR-S, and NBR to remedy the challenges for training issues and tools issues be specific in the formulation of training modules that directly address and helps farmers understand and be at least moderately knowledgeable about agroecology, the production and use of organic fertilizer. The recommended training effort should be tailored to be one of continuous development and progressive nature. Thus, training modules should be communicated in simple language all native languages for ease of understanding the key messages of the content.

Special intervention for access to tools and types of equipment for the production of organic fertilizer is further recommended to be directed at NBR, CRR-S, and URR. Access to tools and equipment may be provided through grants or special farmer programs of low-interest loans, soft loans that may be had through cooperatives to facilitate access to tools and equipment.

**Challenges to accessing information and data on the production of organic Usage**

**Challenges to Standard for Organic Fertilizer.**

**Challenges do you face in accessing research technologies on organic fertilizer usage**

Most of the respondents in all the regions indicated a lack of sources of information and data on the production and usage of organic fertilizer in all the regions. The CRR had the highest percentage (82%) of respondents who mentioned a lack of sources of information followed by LRR (58%) and NBR (55%). The CRR-S recorded the lowest percentage of respondents (39%) as compared to other regions who stated lack of source as their major constraint in accessing

information and data on the production and usage of organic. Similarly, the high cost of data access was indicated by the respondents in the region as one of their constraints. The LRR was found to be highly affected (25%) by the high cost of data than all the other regions followed by CRR (23%), NBR (22%), and URR (18%). The limited internet connectivity was observed as the least (not more than 15%) affected constraint in all the regions.

Based on the findings above, it is highly recommended that intervention efforts to address this challenge are not limited to any specific region. It is recommended that intervention efforts such as media production, and research information about agroecology, and the production and use of organic fertilizer are directed at all the regions; NBR, CRR-N &CRR-S, LRR, and URR. It is recommended that media campaigns especially tailored news items should be incorporated in the media campaigns to be distributed in these regions through mobile film caravans and other innovative ways and devices for dissemination of information. It is also recommended that information on recommended standards for the production of organic fertilizers be developed and disseminated across all regions. Recommended standards for the production and use of organic fertilizer may be developed with the help of experts in the field (within the Gambia or externally). These experts may be sourced, if necessary from across the world.

**Challenges to Access organic fertilizers from agricultural markets**

The result shows that the markets for access to agroecological products in all the survey regions are not adequate. The majority of respondents in CRR-N (82%), LRR (64%), CRRS (49%), and URR (44%) stated that the markets for accessing the agricultural market to procure organic fertilizer are very difficult in their communities. While 26% of them in NBR indicated that the markets for accessing the agricultural market to procure organic fertilizer are very difficult in the region. However, a significant percentage of respondents in CRRS (10%) and NBR (9%) mentioned that the markets for accessing the agricultural market to procure organic fertilizer are easy compared to other regions. Similarly, only CRR-N (2%) and LRR (1%) indicated the markets for accessing the agricultural market to procure organic fertilizer is very easy in their communities.

Based on the findings above, it is highly recommended that intervention efforts to address this challenge are not limited to any specific region. It is recommended that intervention efforts such as the creation of markets for organic fertilizer are directed at all the regions; NBR, CRR-N &CRR-S, LRR, and URR. It is recommended that markets and distribution channels/points are created for marketing and distribution of organic fertilizer. The creation of these markets requires the involvement of the Ministry of Agriculture in collaboration with NGOs who may be keen on addressing the issues of marketing for organic fertilizers.

**Challenges in receiving support and supplies for organic fertilizer production**

The various constraints outlined by the respondents were financial constraints, lack of technical support, supply chain issues, and policy and regulatory barriers. The majority of the respondents in all the regions except CRR-S indicated financial constraint as their main challenge in the production of organic.

The highest percentage of the respondents (51%) who stated financial constraints as their major challenge was recorded in CRR-N followed by LRR (48%), NBR (39%), and URR (37%). For CRR-S, most of the respondents mentioned a lack of technical support as their main constraint in the production of organic fertilizer.

The supply chain issues were stated as the third major constraint and this was mostly highlighted in CRR-S (32%) than all the other regions followed by NBR and URR (22%), CRR-N (21%), and LRR (19%). The policy and regulatory barriers were indicated as the least constraint affecting the production of organic fertilizers in the regions.

Based on the findings above, it is highly recommended that intervention efforts to address this challenge are not limited to any specific region. It is recommended that intervention efforts such as grants and loan programs should be created to facilitate the production of organic fertilizer and that these finance schemes be directed at all the regions especially; NBR, CRR-N & LRR, and URR. It is further recommended that the supply chain for access to organic fertilizer be developed through a specially formulated program overseen by an NGO in collaboration with the Ministry of Agriculture,



**An increase in the cost of chemical fertilizers led to higher production and usage**

The majority of the respondents in CRR-N (71%), LRR (75%), and NBR (55%) strongly agreed that an increase in the cost of chemical fertilizer led to a higher level of usage and production of crops.

Also, most of the respondents in CRRS (44%) followed by NBR (43%) URR (21%) LRR (20%) and CRR-N (15%) agreed that an increase in the cost of chemical fertilizers led to higher usage and level of production of crops.

However, in URR most of the respondents (35%) disagreed that an increase in the cost of chemical fertilizers did not have any influence on the level of usage and production of crops. Similarly, there are small percentage of the respondents in the regions who strongly disagree that an increase in the cost of chemical fertilizer led to a higher level of usage and crop production with the highest recorded in CRRN (10%) followed by CRRS (5%) and URR

Based on the findings, it is recommended that consideration for the production and use of organic fertilizers are at the forefront of efforts for popularizing organic fertilizers. Given the cost factor of chemical fertilizer, it is recommended that intervention efforts be directed at initiatives to

increase the popularity of the usefulness of pivoting toward the use of organic fertilizers. Thus, the initiative of creating affordability of organic fertilizers should be focused on all the regions; CRR-S, CRR-N, LRR, NBR, and URR.

## D. Opportunities for Organic Fertilizer Production

**Analysis of Organic Fertilizer Production Across Regions**

The datasets focus on three key areas related to organic fertilizer production across different regions in The Gambia: the availability of tools, the sufficiency of raw materials, and the availability of necessary infrastructure.

### 3.1. Availability of Tools for Organic Fertilizer Production

**Overall:**

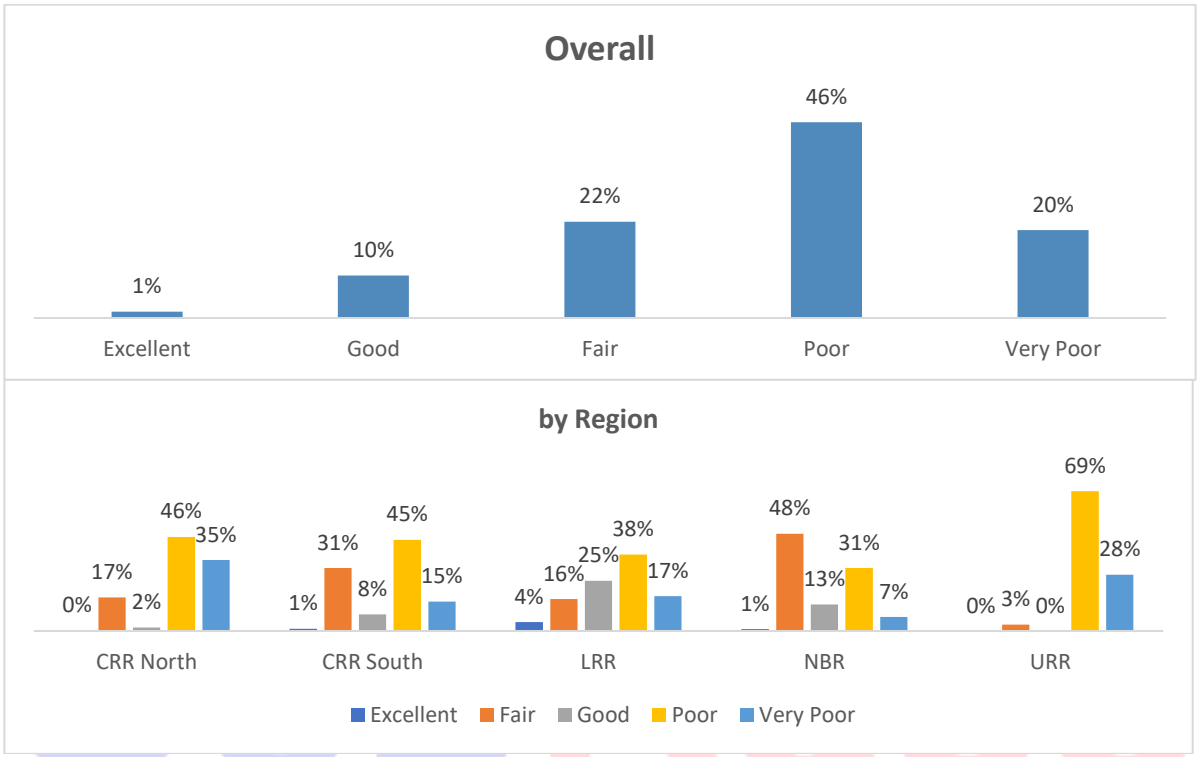
- **Excellent:** 1%
- **Fair:** 22%
- **Good:** 10%
- **Poor:** 46%
- **Very Poor:** 20%



**Regional Insights:**

- **CRR North:** The majority of respondents (46%) rated tool availability as "Poor," and 35% rated it as "Very Poor." Very few respondents rated it positively, indicating a critical lack of tools.
- **CRR South:** A mixed distribution, with **45%** rating the availability of tools as "Poor" and **31%** as "Fair," showing some access to tools, though still largely insufficient.
- **LRR:** A relatively better distribution, with **25%** rating tool availability as "Good," but **38%** still rated it as "Poor."
- **NBR: 48%** rated it as "Fair," which is the best rating among all regions, although **31%** still rated tool availability as "Poor."
- **URR:** The worst-performing region, with **69%** of respondents rating tool availability as "Poor" and **28%** as "Very Poor," showing significant challenges in accessing tools.

## Figure 32: Availability of Tools for Organic Fertilizer Production






**Conclusion:** Overall, **46%** of respondents across all regions rated tool availability as "Poor," indicating a widespread problem. **CRR North** and **URR** have the most significant gaps in tool availability, while **NBR** and **LRR** fare slightly better but still require improvements.

### Targeted Investment Plan:

### 1. Tool Acquisition:

- **Priority Regions:** CRR North, URR, and CRR South should be the primary focus for donor investments in tool acquisition, given the critical shortages.
- **Investment Focus:** Provide region-specific toolkits, including shovels, compost mixers, and transportation equipment for organic raw materials. Investments should focus on cooperative initiatives or community-based distribution models to ensure shared access.

### 2. Training Programs:

- **Priority Regions:** Training programs are crucial for CRR South, NBR, and LRR to leverage the already available resources more effectively.
- **Investment Focus:** Organize technical training sessions on the proper use of available tools and composting techniques. Provide ongoing mentorship and capacity building to ensure sustainable use of organic fertilizer production tools.

### 3. Infrastructure Development:

- **Priority Regions:** URR and CRR North, where tool and infrastructure shortages are the most severe.
- **Investment Focus:** Establish shared facilities or hubs where farmers can access and rent tools, promoting cost-effective use of resources. Develop regional centers equipped with necessary composting and processing infrastructure.

### 4. Capacity Building through Donor Support:

- **Short-Term Goals:** Address immediate gaps by providing basic composting tools and organizing workshops in critical regions (URR, CRR North). Partner with local agricultural development initiatives to facilitate access.
- **Long-Term Goals:** Strengthen regional supply chains by supporting tool distribution networks and investing in the creation of organic fertilizer cooperatives.

This targeted approach, focusing on tools, training, and infrastructure, can significantly enhance the organic fertilizer production capacity across the regions of The Gambia, addressing the current gaps and ensuring long-term sustainability.

## 3.2. Sufficiency of Raw Materials for Organic Fertilizer Production

**Overall:**

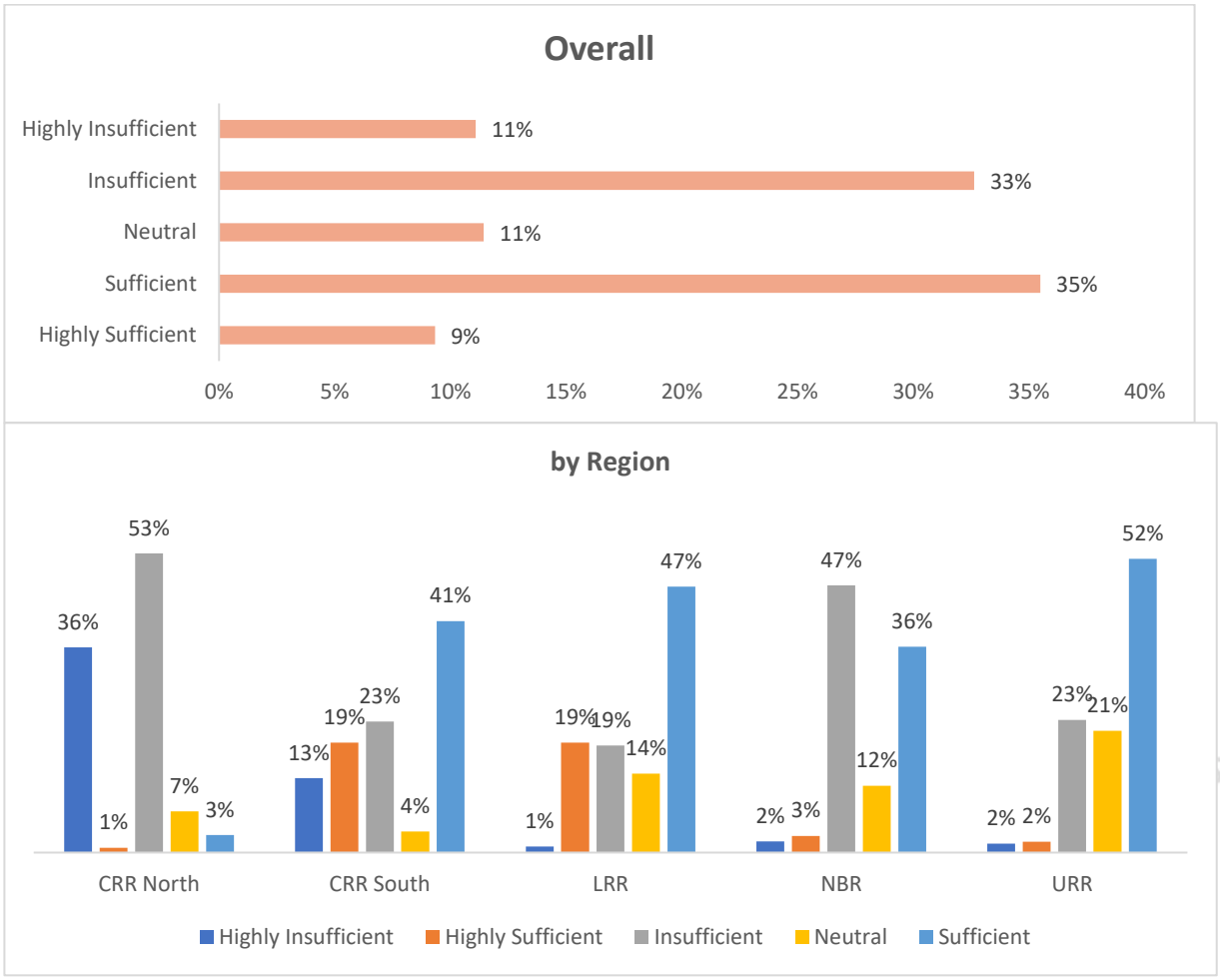
- **Highly Insufficient:** 11%
- **Highly Sufficient:** 9%
- **Insufficient:** 33%
- **Neutral:** 11%
- **Sufficient:** 35%

**Regional Insights:**

- **CRR North: 53%** rated raw material availability as "Insufficient," and **36%** rated it as "Highly Insufficient," showing a critical lack of resources.
- **CRR South:** A more balanced view, with **41%** rating raw materials as "Sufficient" and **23%** as "Insufficient," indicating relatively better access compared to other regions.
- **LRR:** One of the better-performing regions, with **47%** rating raw materials as "Sufficient" and only **1%** finding it "Highly Insufficient."
- **NBR: 47%** rated it as "Insufficient," though **36%** rated it as "Sufficient," suggesting room for improvement.

- **URR:** The best-performing region, with **52%** rating raw materials as "Sufficient" and only **2%** considering them "Highly Insufficient."

## Figure 33: Sufficiency of Raw Materials for Organic Fertilizer Production




**Conclusion: URR** and **LRR** lead in raw material sufficiency for organic fertilizer production, with over **50%** of respondents rating it as "Sufficient." In contrast, **CRR North** struggles the most, with over **50%** reporting significant insufficiency.

## 3.3: Availability of Necessary Infrastructure for Organic Fertilizer Production

**Summary:**

- **Fully Available:** 18%
- **Not Available:** 58%

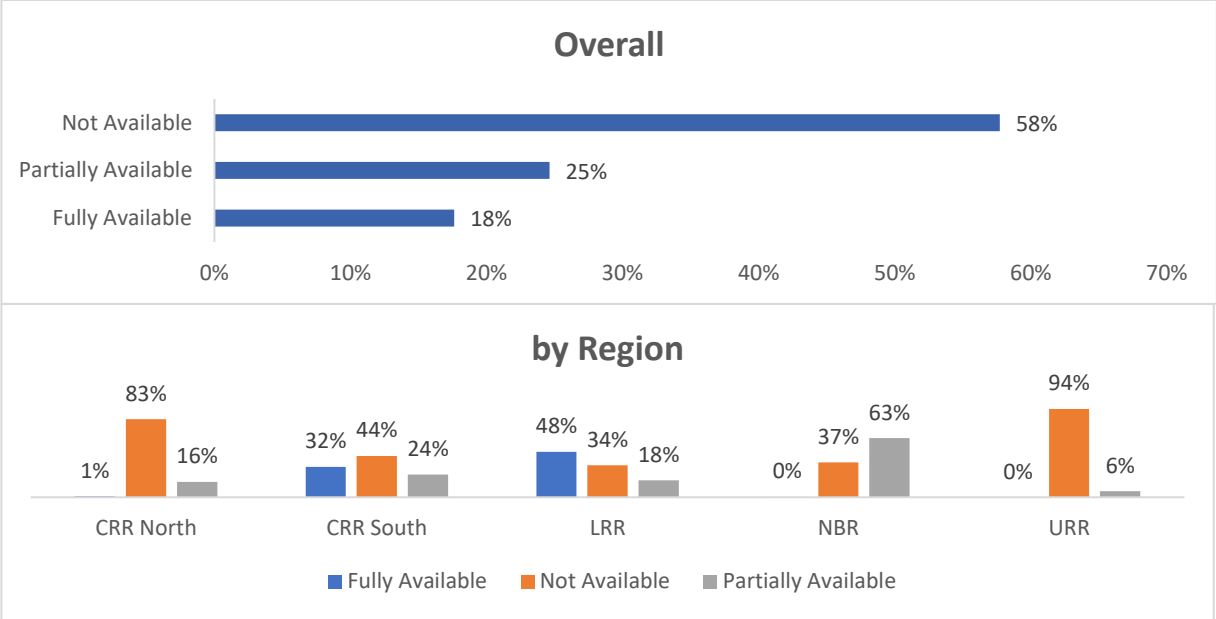
- **Partially Available:** 25%

**Regional Insights:**

- **CRR North:** A staggering **83%** of respondents said infrastructure is "Not Available," highlighting a severe lack of facilities.
- **CRR South: 32%** said infrastructure is "Fully Available," though **44%** still reported it as "Not Available," showing a moderate gap in infrastructure.
- **LRR:** The best-performing region, with **48%** of respondents stating that infrastructure is "Fully Available," though **34%** still lack necessary facilities.
- **NBR: 63%** said infrastructure is "Partially Available," indicating significant gaps but some access.
- **URR:** The worst-performing region, with **94%** of respondents stating that infrastructure is "Not Available," reflecting an extreme lack of resources.



## Figure 34: Availability of Necessary Infrastructure for Organic Fertilizer Production




**Conclusion: LRR** has the best infrastructure availability for organic fertilizer production, while **CRR North** and **URR** face severe infrastructure shortages, with over **80%** of respondents reporting no access to facilities.

## 3.4: Analysis of Knowledge and Skills in Organic Fertilizer Production

The overall distribution indicates a substantial proportion of respondents lack knowledge in organic fertilizer production, with 46% reporting no knowledge. Only 34% of respondents are competent in the field, and just 3% are experts. The percentages of novice and proficient are relatively low.

**Regional Breakdown:**

1. **CRR North:**

The CRR North region has the highest percentage of respondents with no knowledge (82%), and only 13% are competent. There is no expert knowledge in this region.

2. **CRR South:**

CRR South shows a higher percentage of competent individuals (33%) compared to CRR North. However, 45% still report no knowledge, and expertise is minimal.

3. **LRR:**

The LRR region has the highest competency (40%) and expertise (8%), with a relatively low percentage (24%) reporting no knowledge.

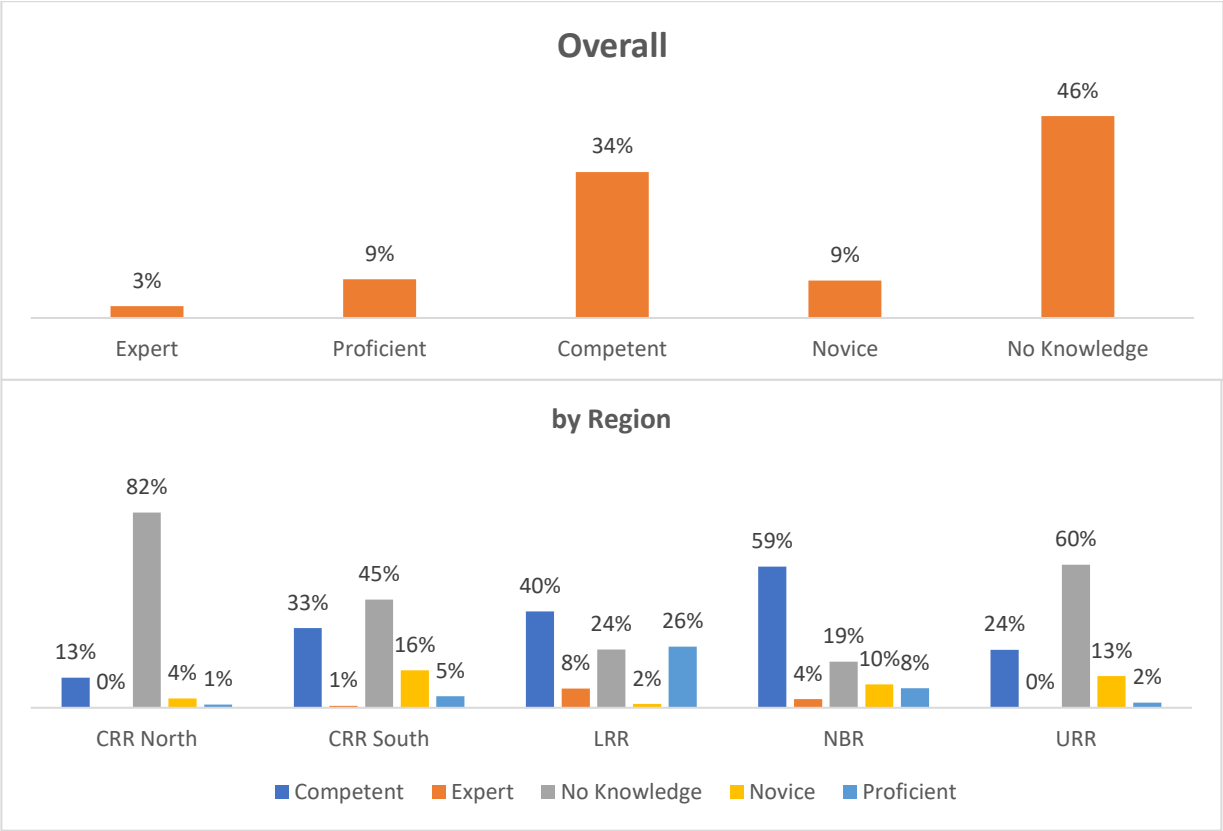
4. **NBR:**

NBR shows the highest percentage of competent individuals (59%) and a relatively low level of knowledge (19%). Expertise and proficiency are also present but less pronounced.

5. **URR:**

URR has the highest percentage of no knowledge (60%) and a low percentage of competence (24%) and expertise (0%

## Figure 35: Analysis of Knowledge and Skills in Organic Fertilizer Product




## 3.5: Analysis of Adequacy of Markets for Organic Fertilizers

Overall, the market adequacy for organic fertilizer is perceived negatively, with 55% of respondents finding it inadequate and 37% finding it highly inadequate. Only a small percentage (3%) view the markets as adequate, and 1% see them as highly adequate.

**Regional Breakdown:**

1. **CRR North:**

CRR North has the highest percentage of respondents who find the market highly inadequate (62%) and inadequate (34%).

2. **CRR South:**

CRR South has a better perception of market adequacy compared to CRR North, with 7% viewing the market as adequate and none seeing it as highly adequate. However, 55% still find it inadequate.

3. **LRR:**

LRR shows a more mixed perception with 5% considering the market adequate and 3% highly adequate, though 51% still find it inadequate.

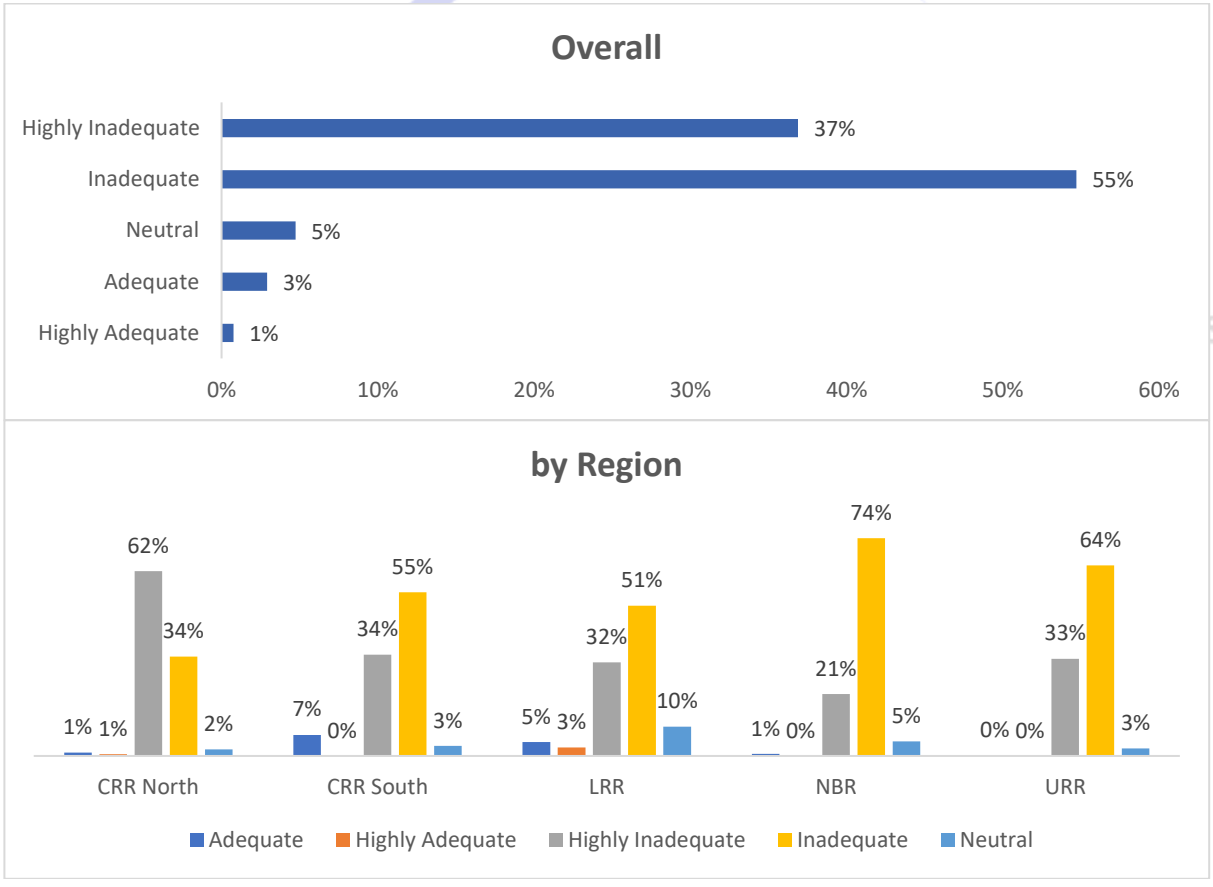
4. **NBR:**

NBR has the highest percentage of respondents who find the market inadequate (74%) and highly inadequate (21%).

5. **URR:**

URR shows a complete lack of perception of the market as adequate or highly adequate, with a significant percentage finding it inadequate (64%) and highly inadequate (33%).

## Figure 36: Analysis of Adequacy of Markets for Organic Fertilizers




**Summary**

- **Knowledge and Skills:**

- The general knowledge and skill level in organic fertilizer production is low across most regions, with a significant number of respondents reporting no knowledge.
- LRR and NBR stand out with higher percentages of competent individuals compared to other regions.

- **Market Adequacy:**
  - The perception of market adequacy for organic fertilizer is predominantly negative, with a high percentage of respondents across all regions finding the markets inadequate or highly inadequate.
  - CRR North and NBR have the highest percentages of respondents perceiving the market as highly inadequate.

Efforts to improve both knowledge and market conditions for organic fertilizer should consider targeted regional interventions and educational programs.

## 3.6. Political Environment Affecting Organic Fertilizer Production

Overall, the political environment is perceived as having a mixed impact on organic fertilizer production. While 46% of respondents feel neutral about the political environment's influence, a significant portion views it negatively (21%) or very negatively (7%). Only 23% perceive it positively, and a small fraction (2%) see it as very positively influencing their ability to produce and use organic fertilizers.

**Regional Breakdown:**

1. **CRR North:**

In CRR North, there is a high perception of a very negative impact (33%) on the political environment, coupled with a notable negative perception (27%). Only 5% view it positively, indicating a generally unfavourable view of political factors.

2. **CRR South:**

CRR South has a more positive outlook with 40% of respondents seeing the political environment as positively impacting their ability to produce and use organic fertilizers. The perception of a very negative impact is absent, and only 14% view it negatively.

3. **LRR:**

In LRR, the political environment is perceived as having a substantial negative impact (34%), though 43% remain neutral. The positive impact is relatively low (20%).

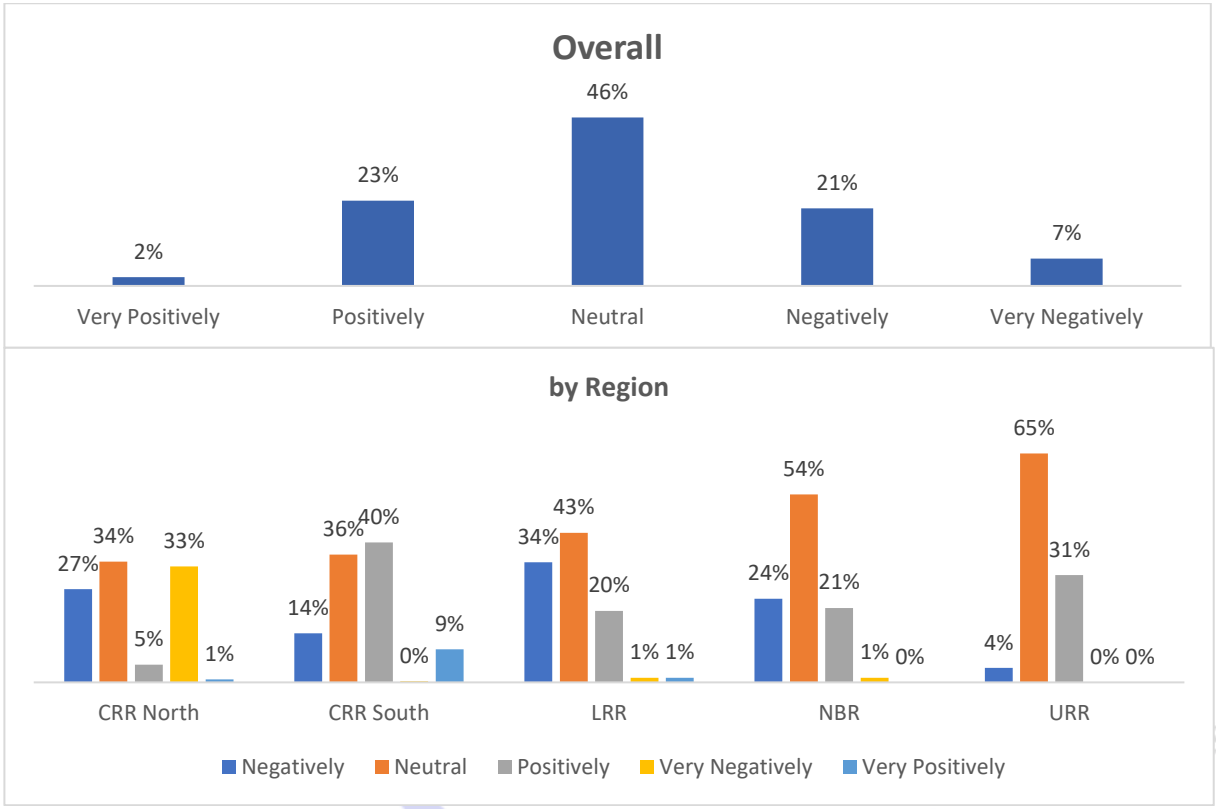
4. **NBR:**

NBR reflects a predominantly neutral view (54%) on the political environment, with 24% perceiving it negatively. There is a minimal perception of very negative or very positive impacts.

5. **URR:**

URR stands out with a high percentage of respondents feeling neutral (65%) and a significant portion (31%) viewing the political environment positively. There is no perception of a very negative or very positive impact.

### Figure 37: Political Environment Affecting Organic Fertilizer Productivity




## 3.7: Socio-Economic Environment Supporting Organic Fertilizer Production

Overall, the socio-economic environment is viewed with mixed sentiments. While 26% agree that the socio-economic environment supports organic fertilizer production, a nearly equal portion (27%) disagree. A notable percentage (23%) strongly disagree, indicating some concerns about socio-economic support.

**Regional Breakdown:**

1. **CRR North:**

In CRR North, a significant proportion (43%) strongly disagree with the notion that the socio-economic environment supports organic fertilizer production. Only 13% agree, reflecting a generally negative view.

2. **CRR South:**

CRR South shows a more balanced view with 34% agreeing that the socio-economic environment supports fertilizer production. However, a substantial portion (30%) strongly disagree.

3. **LRR:**

LRR has a strong agreement (32%) that the socio-economic environment supports organic fertilizer production, although 32% disagree, indicating mixed opinions.

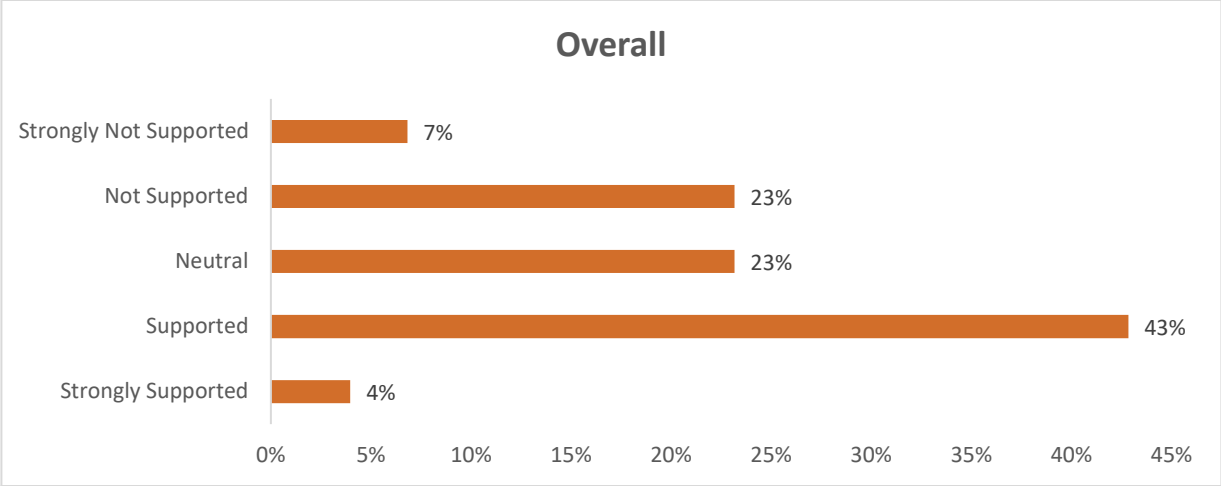
4. **NBR:**

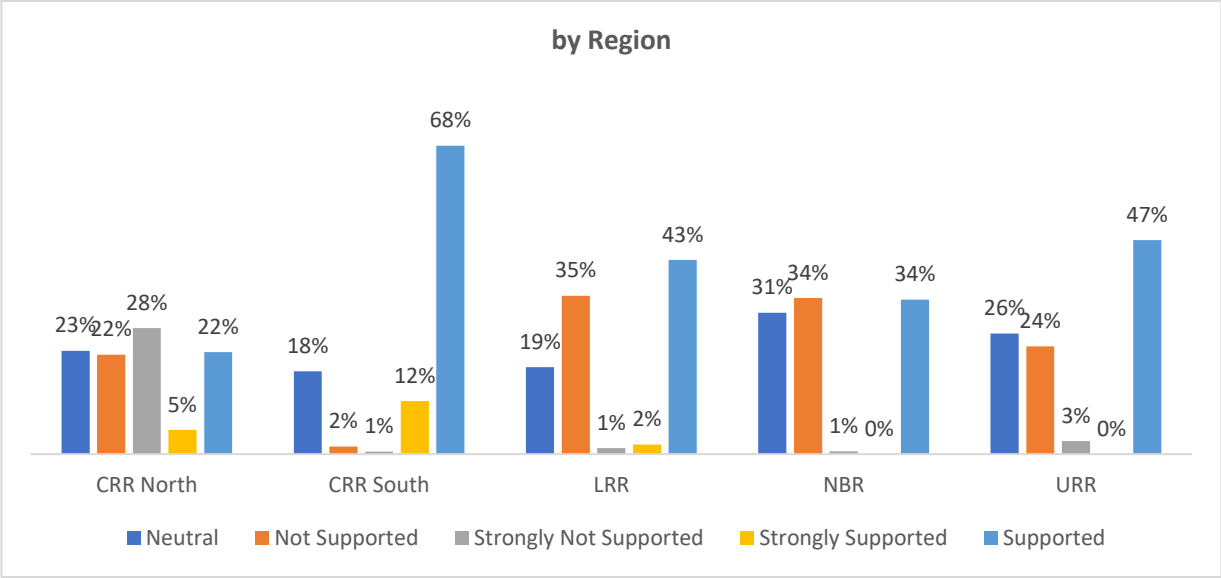
NBR shows a positive view with 45% agreeing that the socio-economic environment supports production. There is a lower percentage of strong disagreement (11%).

5. **URR:**

URR has a significant portion (34%) disagreeing with the support from the socio-economic environment, with only 19% agreeing.

**Figure 38: Socio-Economic Environment Supporting Organic Fertilizer Production**




## 3.8: Requisite Knowledge About Organic Fertilizer Production

Overall, a large majority of respondents (93%) report having no requisite knowledge about organic fertilizer production, indicating a significant gap in essential knowledge.

**Regional Breakdown:**

1. **CRR North:**

CRR North has an extremely high percentage (99%) reporting no requisite knowledge, highlighting a critical need for educational interventions.

2. **CRR South:**

CRR South also shows a high percentage (85%) with no requisite knowledge, though there is a somewhat higher percentage (15%) with some knowledge compared to CRR North.

3. **LRR:**

LRR reflects a similar trend to CRR North, with 98% lacking requisite knowledge.

4. **NBR:**

NBR shows a notable percentage (10%) with the requisite knowledge, though the majority (90%) still lack it.

5. **URR:**

URR has a high percentage (94%) with no requisite knowledge, though slightly better than other regions.

**4. Government Support for Organic Fertilizer Production**

Overall, government support for organic fertilizer production is perceived as low, with 42% of respondents viewing it as low and 39% as very low. Only 8% perceive it as high.

**Regional Breakdown:**

1. **CRR North:**

CRR North has the highest percentage of respondents viewing government support as very low (51%) and low (34%).

2. **CRR South:**

CRR South has a relatively better perception with 27% viewing government support as high, though 32% still see it as very low.

3. **LRR:**

LRR reflects a similar view with 45% perceiving government support as very low and 38% as low.

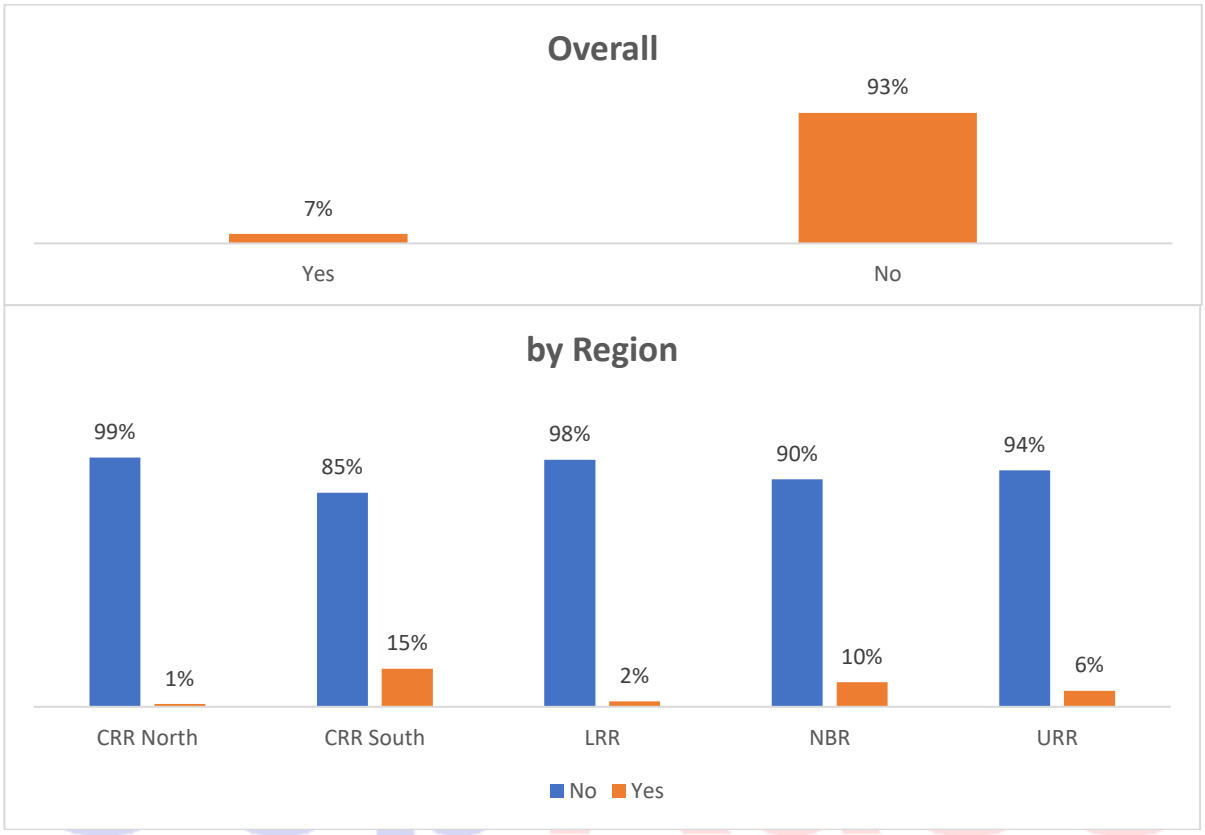
4. **NBR:**

NBR shows a strong perception of low support, with 66% rating it as low and 17% as very low.

5. **URR:**

URR has the highest percentage of respondents rating government support as very low (46%), with no perception of high support.

**Figure 39: Requisite Knowledge About Organic Fertilizer Production**






## 3.9: Donor Agencies' Support for Organic Fertilizer Production

Overall, donor agencies' support is seen as mixed but relatively positive, with 43% of respondents feeling supported and only 7% feeling strongly not supported.

**Regional Breakdown:**

1. **CRR North:**

CRR North has a significant portion feeling strongly not supported (28%) and relatively low perceived support (22%).

2. **CRR South:**

CRR South shows a positive perception with 68% feeling supported by donor agencies and minimal feeling of strong non-support.

3. **LRR:**

LRR has a mixed view with 35% feeling not supported but 43% feeling supported.

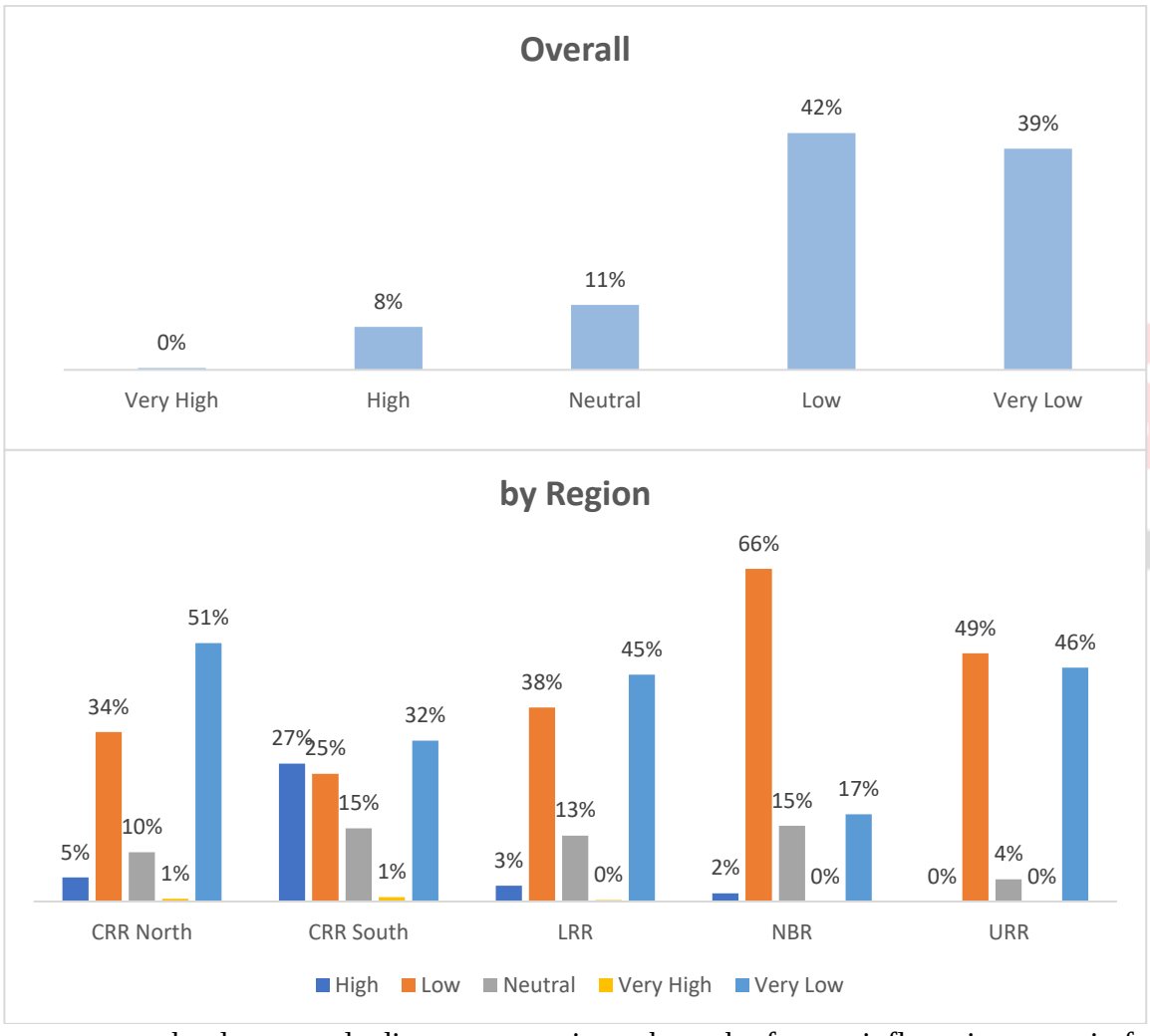
4. **NBR:**

NBR has a balanced view with 34% feeling supported and a significant portion feeling neutral (31%).

5. **URR:**

URR shows the highest percentage of feeling supported by donor agencies (47%) and a relatively low feeling of strong non-support.

## Figure 40: Donor Agencies' Support for Organic Fertilizer Production




In summary, the data reveals diverse perceptions about the factors influencing organic fertilizer production across different regions, highlighting the need for targeted interventions to address knowledge gaps, improve market conditions, and enhance support from both government and donor agencies.

# E. CHALLENGES IN AGROECOLOGY

## 4.1: Knowledge of the concept and practice of agroecology

The figure presents a breakdown of perceptions regarding the knowledge and practice of agroecology, categorized into five ratings: Excellent, Fair, Good, Poor, and Very Poor. Here's an analysis based on overall trends and regional variations:

**Overall Analysis:**

- **Good (37%)**: This rating has the highest overall representation, indicating that a large proportion of respondents have a moderately positive view of their knowledge or experience with agroecology.
- **Poor (24%)** and **Fair (24%)**: These ratings suggest that significant gaps remain in understanding or applying agroecological principles, with around half of the respondents feeling that their knowledge is either poor or just fair.
- **Very Poor (9%)**: A smaller but concerning portion of respondents rate their knowledge as very poor, signalling areas where intervention may be necessary.
- **Excellent (5%)**: The smallest category, with very few respondents considering their knowledge of agroecology to be excellent, showing that only a minority feel highly confident in this area.

**Regional Analysis:**

- **CRR North**:
    - **Poor (42%)** is the most common response, showing a significant deficit in knowledge or practice in this region.
    - Only **6%** of respondents consider their knowledge to be **Excellent**, and **13%** rate it as **Good**, indicating room for improvement.
    - The high percentage of **Very Poor (18%)** ratings further demonstrates a need for intervention in this region.
- **CRR South**:
    - **Good (34%)** is the most frequent response here, which is higher than the regional average, suggesting that there is some positive knowledge base, but it's not widespread.
    - **Poor (21%)** and **Very Poor (20%)** ratings are also high, indicating the need to enhance understanding and practice in this region as well.
    - Only **7%** rated their knowledge as **Excellent**.
- **LRR**:
    - This region stands out positively with **65%** rating their knowledge as **Good** and **10%** as **Excellent**. This suggests that LRR is better positioned compared to other regions in terms of understanding and applying agroecological practices.

- However, **Poor (9%)** and **Very Poor (2%)** ratings, while lower than other regions, still indicate that gaps exist.

- **NBR**:
  - A significant portion (**49%**) rated their knowledge as **Fair**, while **Good (35%)** ratings are lower than the overall average. This suggests that while some understanding exists, much of it is basic or incomplete.
  - **Poor (11%)** and **Very Poor (3%)** are relatively low, suggesting fewer extreme knowledge gaps than in other regions.
  - **Excellent (2%)** is the lowest across regions, further emphasizing the need for improvement.

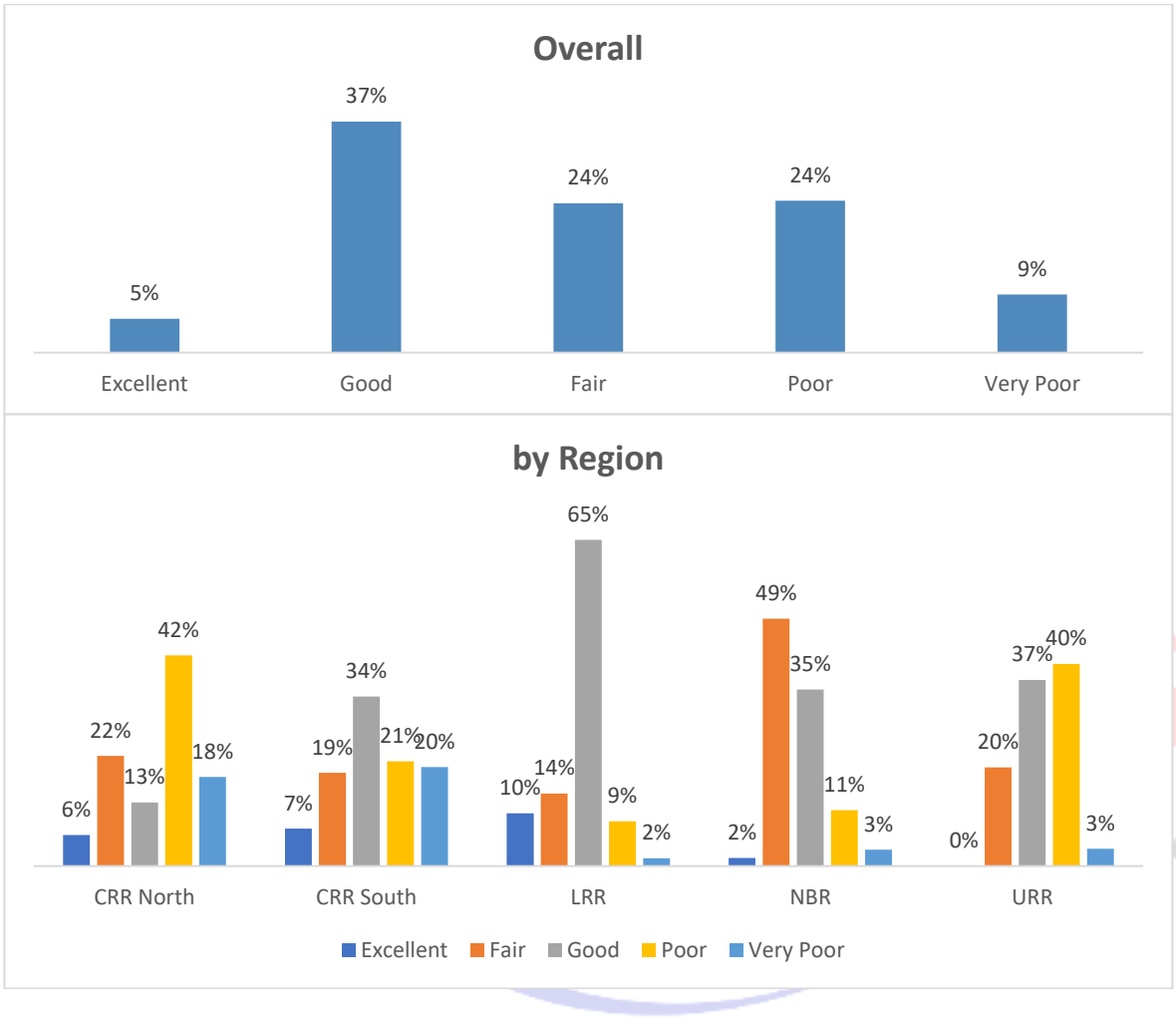
- **URR**:
  - **Poor (40%)** is the most common rating, showing that knowledge and practice in agroecology are significantly lacking in this region.
  - **Good (37%)** is comparable to the overall average, indicating that while some respondents have a good understanding, many others do not.
  - No respondents rated their knowledge as **Excellent**, highlighting a complete absence of strong confidence in agroecology understanding in this region.

**Conclusion:**

- **LRR** seems to have the highest overall level of knowledge and practice regarding agroecology, as evidenced by the high percentages of **Good (65%)** and **Excellent (10%)** ratings. However, even in this region, there are areas needing improvement.
- **CRR North** and **URR** stand out for having the most **Poor** and **Very Poor** ratings, indicating significant gaps in knowledge and practice. These regions should be targeted for capacity-building efforts.
- The majority of respondents in most regions feel their knowledge is either **Fair** or **Good**, suggesting that while there is a foundational understanding of agroecology, there is still considerable work to be done to improve both awareness and practical application of agroecology practices across all regions.

To improve the overall knowledge base, efforts should focus on training programs, providing accessible information, and creating hands-on opportunities for learning about agroecology, particularly in regions like **CRR North** and **URR** where knowledge gaps are most evident.

**Figure 41: Knowledge of the concept and practice of agroecology**




## 4.2: Availability of trained personnel in agroecology

The table reflects the perceptions of the availability of trained personnel in agroecology across different regions, divided into five categories: **Available**, **Highly Available**, **Highly Unavailable**, **Neutral**, and **Unavailable**. Here's a detailed analysis based on overall trends and regional variations:

**Overall Analysis:**

- **Unavailable (40%)**: This is the most frequently reported category overall, indicating that a significant portion of respondents feel that trained personnel in agroecology are largely unavailable across the regions. This highlights a critical gap in human resources for agroecology.

- **Available (25%)**: A quarter of respondents report that trained personnel are available, though this percentage is still relatively low considering the importance of agroecological practices.
- **Neutral (24%)**: A substantial number of respondents remain neutral, which could indicate either limited awareness of the presence of trained personnel or mixed experiences.
- **Highly Unavailable (9%)**: A small but notable portion of respondents indicate that trained personnel are highly unavailable.
- **Highly Available (2%)**: Very few respondents report high availability of trained personnel, showing that significant improvements are needed to address this shortfall.

**Regional Analysis:**

- **CRR North**:
    - **Unavailable (35%)** is the most common perception in this region, indicating a significant deficit in trained personnel for agroecology.
    - A considerable **28%** consider trained personnel to be **Highly Unavailable**, reinforcing the perception of a critical shortage.
    - Only **17%** of respondents feel that trained personnel are **available**, while **1%** perceive them as **Highly Available**, showing that agroecology expertise is scarce in this region.
- **CRR South**:
    - **Available (35%)** is the highest percentage in this region, indicating a relatively more optimistic perception of personnel availability compared to other regions.
    - However, the same percentage (35%) also reports personnel as **Unavailable**, reflecting a stark divide in experiences or perceptions.
    - A small percentage (**3%**) perceive personnel as **Highly Available**, while the **Neutral (25%)** group reflects a significant portion with mixed or unsure perceptions.
- **LRR**:
    - **Available (31%)** is high, suggesting that trained personnel are more available here than in most other regions.
    - The **Unavailable (36%)** and **Neutral (24%)** groups, however, indicate that the availability is not widespread or reliable.
    - **Highly Available (7%)** is the highest among all regions, suggesting that there are isolated pockets of expertise, though these may not be consistent across the region.
- **NBR**:
    - **Unavailable (37%)** is the dominant perception in this region, reflecting a significant lack of trained agroecology personnel.

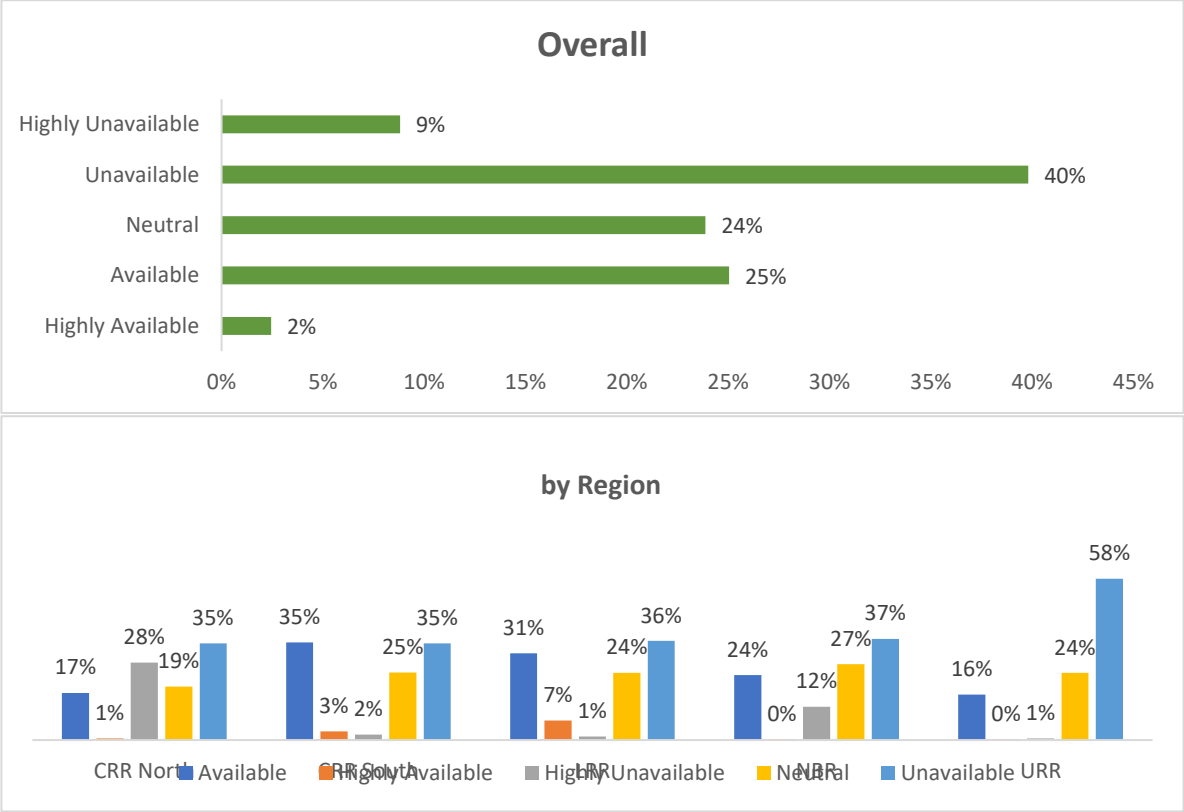
- **Available (24%)** is reported by almost a quarter of respondents, but it remains lower than the proportion of those who find personnel unavailable.
- **Highly Unavailable (12%)** is relatively high, further reinforcing the perception of personnel shortage in this region.
- There are no reports of **Highly Available** personnel, highlighting the need for targeted capacity-building efforts.

- **URR**:
  - **Unavailable (58%)** is the highest across all regions, showing that this region faces the most critical shortage of agroecology expertise.
  - **Available (16%)** is significantly lower than the overall average, suggesting that very few respondents feel that trained personnel are available in this region.
  - The **Neutral (24%)** percentage indicates that there is a portion of the population that may not have enough information to accurately assess availability, but the strong consensus on unavailability suggests widespread challenges.

**Conclusion:**

- **Availability Gaps**: Across all regions, the most common perception is that trained agroecology personnel are **Unavailable** or **Highly Unavailable**. With **40%** reporting unavailability overall, it is clear that access to trained personnel is a major challenge.
- **Region-Specific Observations**:
  - **URR** and **CRR North** show the most severe shortages, with **URR** reporting an alarming **58%** in the **Unavailable** category, and **CRR North** reporting high levels of both **Unavailable** and **Highly Unavailable** personnel.
  - **CRR South** and **LRR** have relatively more positive perceptions of availability, but these regions are still far from ideal, as they also report significant levels of **Unavailable** personnel.
- **Highly Available Personnel**: The **Highly Available** category is strikingly low across all regions, with only **2%** reporting this, indicating a critical lack of highly accessible expertise in agroecology.

Figure 42: Availability of trained personnel in agroecology






## 4.3: Adequate funds for implementing agroecology practices

The figure represents the perceptions of adequacy regarding funds for implementing agroecology practices across different regions. The five categories of responses are **Adequate**, **Highly Adequate**, **Highly Inadequate**, **Inadequate**, and **Neutral**. Here's a detailed analysis based on the overall data and regional differences:

**Overall Analysis:**

- **Inadequate (67%)**: The majority of respondents (67%) across all regions feel that the funds for implementing agroecology practices are **Inadequate**. This suggests a widespread perception that financial resources are insufficient to effectively support agroecology initiatives.
- **Highly Inadequate (22%)**: Adding to the inadequacy issue, another 22% of respondents believe the funds are **Highly Inadequate**, further emphasizing the critical lack of funding.
- **Adequate (4%)** and **Highly Adequate (1%)**: Only a small fraction of respondents feel that the funds are **Adequate** (4%) or **Highly Adequate** (1%), indicating that very few regions perceive financial resources as sufficient for agroecology.

- **Neutral (7%)**: A minority of respondents (7%) remain neutral, possibly indicating uncertainty or lack of detailed knowledge about funding adequacy.

**Regional Analysis:**

- **CRR North**:
    - **Inadequate (48%)** is the most common perception, with nearly half of the respondents feeling that the funds are insufficient.
    - An additional **47%** of respondents believe that funds are **Highly Inadequate**, indicating that CRR North faces a severe lack of funding for agroecology practices.
    - Only **3%** report the funds as **Adequate**, and there are no responses for **Highly Adequate**, highlighting the dire need for increased financial support in this region.
- **CRR South**:
    - **Inadequate (71%)** is the dominant category, with the overwhelming majority of respondents in this region indicating a lack of adequate funding.
    - **Highly Inadequate (21%)** adds to this, though to a lesser extent than in CRR North.
    - **Adequate (4%)** and **Highly Adequate (1%)** are very small percentages, reflecting a general consensus on the inadequacy of funds in this region.
    - **Neutral (4%)** responses suggest some uncertainty or a mixed understanding of funding levels.
- **LRR**:
    - **Inadequate (63%)** remains the most common perception, but it is slightly lower than the overall average.
    - **Highly Inadequate (13%)** is also reported but at a lower level compared to other regions.
    - A small but notable **8%** of respondents feel that the funds are **Adequate**, and **5%** report them as **Highly Adequate**, making LRR the region with the highest perception of adequate funding, though it still faces significant shortfalls.
- **NBR**:
    - **Inadequate (82%)** is the highest among all regions, suggesting that the Northern Bank Region (NBR) faces the most critical funding shortages for agroecology practices.
    - Only **2%** of respondents report funds as **Adequate**, and there are no responses for **Highly Adequate**, showing that financial support is overwhelmingly perceived as insufficient in this region.
    - **Highly Inadequate (9%)** is lower compared to other regions, but the overall inadequacy perception is quite severe.

- **URR**:
    - **Inadequate (73%)** is the dominant category, with most respondents perceiving insufficient funds for agroecology implementation.
    - **Highly Inadequate (16%)** is relatively higher than some other regions, showing a significant funding gap.
    - Only **1%** of respondents report funds as **Adequate**, and none report them as **Highly Adequate**, indicating the extreme financial constraints in this region.

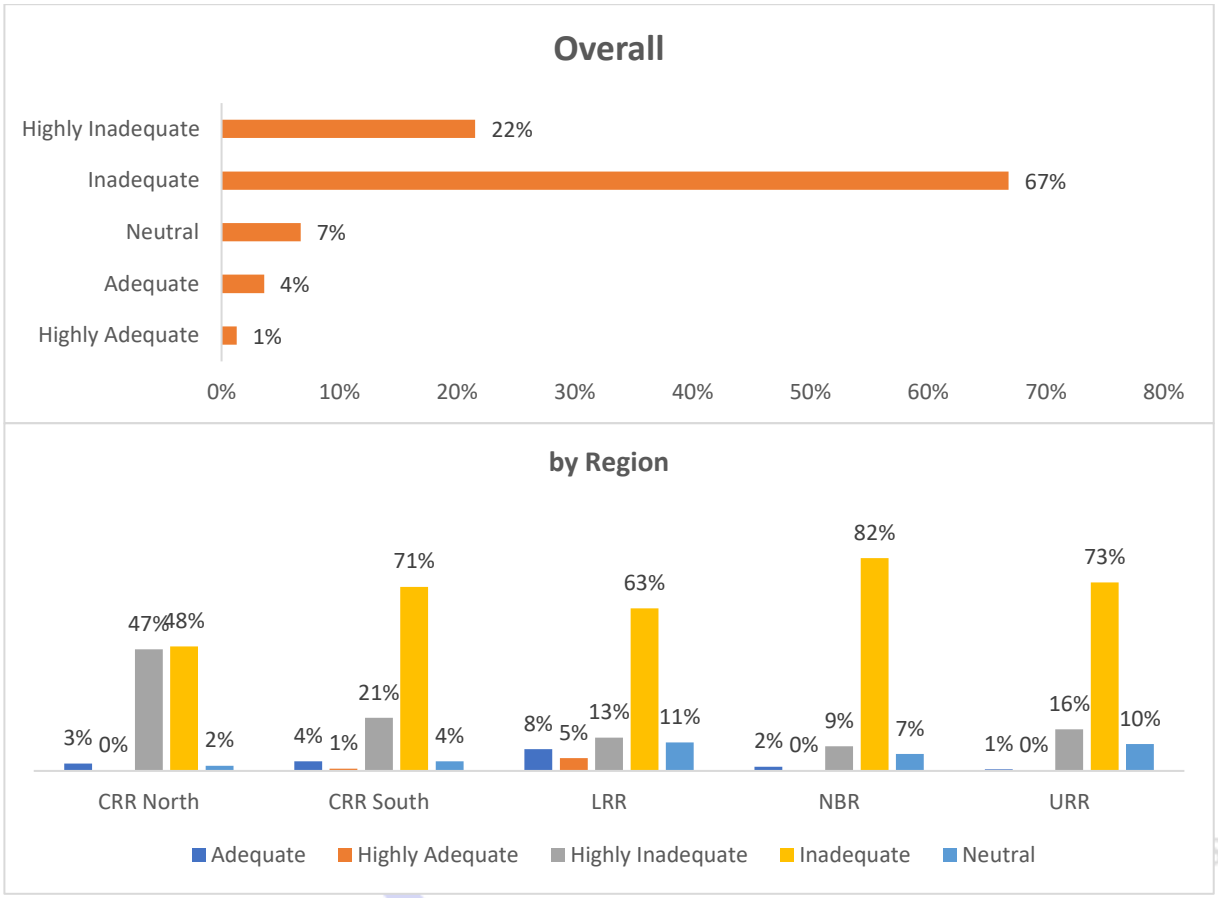
**Conclusion:**

- **Widespread Inadequacy**: Across all regions, the perception of inadequate funds is overwhelming, with **67%** reporting **Inadequate** and an additional **22%** reporting **Highly Inadequate** funds for agroecology. This means that nearly **90%** of respondents across the board feel that funding is insufficient, pointing to a critical need for financial investment.
- **Highly Adequate and Adequate Funds**: Only a very small portion of respondents report that the funds are adequate, with **4%** for **Adequate** and just **1%** for **Highly Adequate**, which means there is little belief in the sufficiency of funds to support agroecology initiatives effectively.

**Regional Observations:**

- **CRR North** and **NBR** face particularly critical shortages, with very high percentages of respondents reporting funds as either **Highly Inadequate** or **Inadequate**.
- **CRR South** also faces significant challenges, with **71%** reporting **Inadequate** funds.
- **LRR** shows slightly more optimistic views compared to other regions, with **8%** reporting **Adequate** funds and **5%** reporting **Highly Adequate**, although the majority still perceive funds as **Inadequate**.
- **URR** similarly faces severe shortages, with **73%** reporting **Inadequate** funds and a smaller group of **16%** reporting **Highly Inadequate** funds.

**Figure 43: Adequate are the funds for implementing agroecology practice**




## 4.4: Aware are the youth of agroecology practices

The figure presents data on the awareness levels of youth regarding agroecology practices across different regions. The categories are **Aware**, **Neutral**, **Unaware**, **Very Aware**, and **Very Unaware**. Here's an analysis of the overall trends and regional differences:

**Overall Analysis:**

- **Aware (50%)**: Across all regions, half of the respondents report being **Aware** of agroecology practices. This suggests a moderate level of awareness, indicating that while many young people are familiar with agroecology, there is still a significant portion that needs further exposure and education.
- **Very Aware (17%)**: A smaller but significant 17% of respondents are **Very Aware** of agroecology practices, showing that a portion of youth have a strong understanding of the concept.

- **Unaware (20%)**: About 20% of respondents across all regions are **Unaware** of agroecology practices, which highlights a need for targeted awareness campaigns to increase knowledge and participation.
- **Neutral (10%)**: A small percentage of respondents (10%) are **Neutral**, likely indicating uncertainty or limited knowledge about agroecology.
- **Very Unaware (3%)**: Only 3% report being **Very Unaware**, suggesting that complete unfamiliarity with agroecology practices is relatively rare but still present.

**Regional Analysis:**

- **CRR North**:
    - **Aware (36%)**: A little over a third of youth in CRR North are **Aware** of agroecology, which is below the overall average.
    - **Very Aware (18%)**: A decent proportion of respondents are **Very Aware**, indicating that agroecology has reached some level of recognition in this region.
    - **Unaware (35%)**: A concerning 35% of respondents are **Unaware** of agroecology, making this the region with one of the highest levels of unawareness.
    - **Neutral (3%)** and **Very Unaware (6%)**: A small portion is **Neutral**, and **Very Unaware** represents only 6% of the region's youth.
- **CRR South**:
    - **Aware (41%)** and **Very Aware (33%)**: CRR South has a relatively high level of awareness, with a combined 74% of respondents reporting being either **Aware** or **Very Aware**. This indicates good outreach efforts and knowledge distribution in this region.
    - **Unaware (9%)**: Only a small fraction (9%) is **Unaware**, suggesting a strong penetration of agroecology knowledge.
    - **Neutral (15%)**: The relatively high **Neutral** response suggests some uncertainty about agroecology knowledge.
    - **Very Unaware (1%)**: There is a very low level of complete unfamiliarity in this region.
- **LRR**:
    - **Aware (74%)**: LRR leads in awareness, with an impressive 74% of respondents reporting being **Aware** of agroecology. This suggests strong education and outreach efforts in the region.
    - **Very Aware (13%)**: A smaller percentage is **Very Aware**, indicating room for deepening knowledge, but overall awareness is high.

- **Unaware (5%)**: Very few respondents are **Unaware** of agroecology, making LRR one of the best-performing regions in terms of knowledge dissemination.
- **Neutral (8%)**: A small portion of respondents are **Neutral**.
- **Very Unaware (0%)**: No respondents report being completely unfamiliar with agroecology, highlighting the effectiveness of awareness programs in LRR.

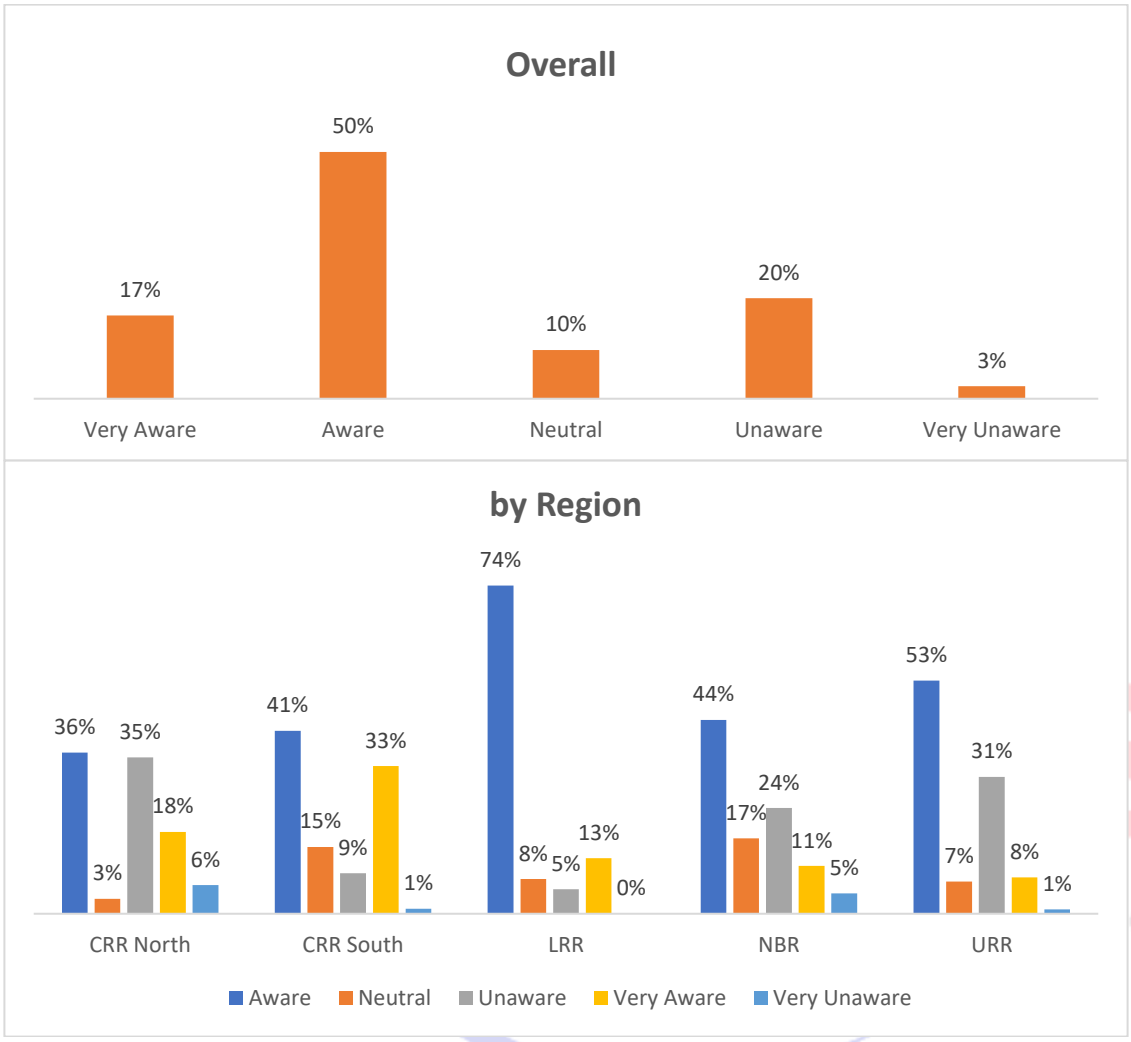
- **NBR**:
  - **Aware (44%)**: NBR has a moderate awareness level, with **44%** of respondents reporting being **Aware** of agroecology.
  - **Very Aware (11%)**: A smaller percentage are **Very Aware**, indicating a moderate understanding of the topic.
  - **Unaware (24%)**: A significant portion of respondents (24%) are **Unaware**, which points to gaps in knowledge distribution.
  - **Neutral (17%)**: NBR has one of the highest **Neutral** responses, indicating that a substantial number of youth may be uncertain or lack strong opinions on agroecology.
  - **Very Unaware (5%)**: A small portion of the population remains **Very Unaware** of agroecology practices.
- **URR**:
  - **Aware (53%)**: URR has a fairly strong awareness level, with more than half of respondents reporting being **Aware** of agroecology.
  - **Very Aware (8%)**: A smaller portion of respondents are **Very Aware**, indicating that there is still room for deeper understanding.
  - **Unaware (31%)**: A relatively high number of respondents (31%) are **Unaware** of agroecology, indicating the need for greater outreach efforts in this region.
  - **Neutral (7%)**: A small percentage of respondents are **Neutral**, showing that most respondents have an opinion about agroecology.
  - **Very Unaware (1%)**: Very few respondents are completely unfamiliar with agroecology in this region.

**Conclusion:**

- **High Awareness in LRR**: LRR has the highest awareness of agroecology practices, with **74%** of respondents reporting being **Aware**, and no one reporting being **Very Unaware**. This suggests that agroecology awareness campaigns and education efforts have been particularly successful in this region.

- **Moderate Awareness in CRR South and URR**: Both regions have good awareness levels but still face challenges in reaching a portion of the youth who are **Unaware**. In CRR South, **74%** are either **Aware** or **Very Aware**, while in URR, **53%** report being **Aware**.
- **Knowledge Gaps in CRR North and NBR**: CRR North and NBR show significant gaps in awareness, with **35%** and **24%** of respondents reporting being **Unaware**, respectively. These regions would benefit from targeted campaigns to improve knowledge and understanding of agroecology practices.
- **Unawareness and Neutrality**: The combined **20%** reporting as **Unaware** and **10%** as **Neutral** across regions highlights that one in three youth either lacks knowledge or is uncertain about agroecology practices. This group represents an opportunity for targeted education and outreach.
- **Room for Improvement in Very Aware**: While **50%** are generally aware, only **17%** report being **Very Aware**. This suggests that while basic awareness exists, there is a need for deeper education to ensure that youth not only know about agroecology but fully understand its importance and practices.

## Figure 44: Aware is the youth about agroecology practices




## 4.5: Youth in the implementation of agroecology

This figure provides insights into the level of interest among youth in different regions regarding their involvement in the **implementation of agroecology**. The interest levels are divided into five categories: **Interested**, **Neutral**, **Uninterested**, **Very Interested**, and **Very Uninterested**. Below is an analysis based on both the **overall trends** and **regional variations**:

**Overall Analysis:**

- **Interested (100%)**: The overall trend shows that there is notable interest among youth across all regions in the implementation of agroecology, suggesting a general willingness to engage with agroecology-related activities.
- **Very Interested (100%)**: There is a significant proportion of youth who are **Very Interested**, indicating a strong commitment among certain groups towards agroecology.

- **Neutral (100%)**: A considerable percentage of respondents across all regions report a **Neutral** stance, which could indicate indecision or a lack of understanding of the topic.
- **Uninterested (100%)** and **Very Uninterested (100%)**: These categories highlight that there are still notable portions of youth who are disengaged or lack interest in agroecology implementation.

**Regional Analysis:**

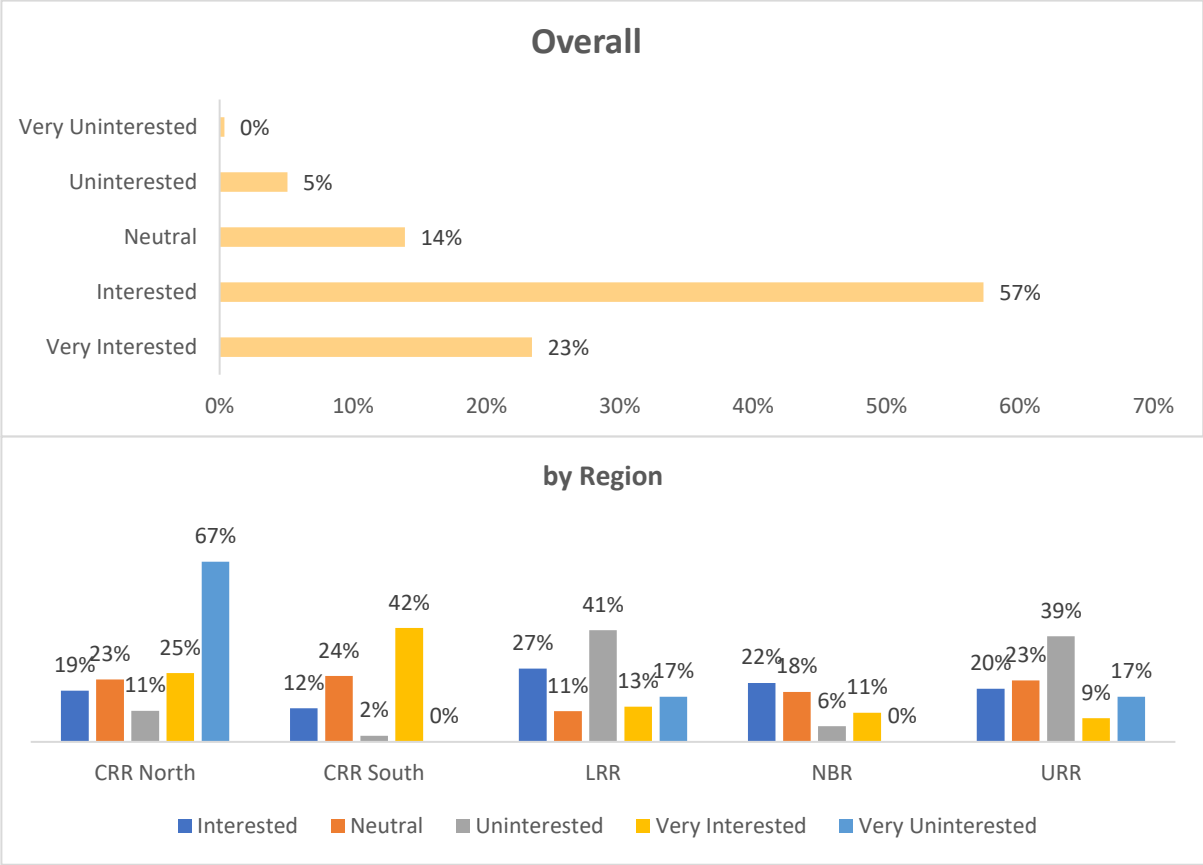
- **CRR North**:
    - **Interested (19%)**: A relatively small portion of youth in CRR North express interest in agroecology, indicating moderate engagement.
    - **Very Interested (25%)**: A quarter of respondents are highly interested, signalling the potential for further engagement in the region.
    - **Neutral (23%)**: A significant portion of the youth remains uncertain about their stance on agroecology.
    - **Uninterested (11%)** and **Very Uninterested (67%)**: A concerning 67% are **Very Uninterested**, indicating strong disengagement in this region, which suggests a need for targeted outreach to address barriers to interest.
- **CRR South**:
    - **Interested (12%)** and **Very Interested (42%)**: CRR South has the highest level of interest in agroecology implementation, with a combined 54% of respondents being either **Interested** or **Very Interested**. This suggests that youth in this region are more open to participating in agroecology initiatives.
    - **Neutral (24%)**: A quarter of respondents are **Neutral**, which may indicate uncertainty or insufficient exposure to agroecology practices.
    - **Uninterested (2%)** and **Very Uninterested (0%)**: The **Uninterested** group is small, and **Very Uninterested** responses are non-existent, indicating minimal disengagement in this region.
- **LRR**:
    - **Interested (27%)**: LRR has the highest percentage of youth expressing **Interest** in agroecology, indicating strong potential for engagement in this region.
    - **Very Interested (13%)**: A smaller portion is **Very Interested**, showing room for deeper engagement.
    - **Neutral (11%)**: The **Neutral** stance is relatively low in LRR compared to other regions.
    - **Uninterested (41%)** and **Very Uninterested (17%)**: A significant percentage of youth are either **Uninterested** or **Very Uninterested**, which highlights the need for more focused educational and engagement efforts.

- **NBR**:
    - **Interested (22%)** and **Very Interested (11%)**: NBR shows moderate levels of interest in agroecology implementation, with 33% of respondents showing a positive inclination.
    - **Neutral (18%)**: A relatively small percentage of respondents remain undecided or indifferent to agroecology implementation.
    - **Uninterested (6%)**: A small portion is **Uninterested**, and there are no **Very Uninterested** responses, indicating that NBR is less likely to have strong opposition or disengagement compared to other regions.
- **URR**:
    - **Interested (20%)** and **Very Interested (9%)**: URR has a combined 29% of respondents showing **Interest** in agroecology, which is relatively low compared to other regions.
    - **Neutral (23%)**: A significant portion of youth remain undecided.
    - **Uninterested (39%)** and **Very Uninterested (17%)**: The majority of respondents in URR fall into the **Uninterested** or **Very Uninterested** categories, making this region one of the most disengaged when it comes to youth participation in agroecology.

**Conclusion:**

- **High Interest in CRR South**: CRR South stands out with **42%** of respondents being **Very Interested** in agroecology implementation, and no youth reporting being **Very Uninterested**. This region seems to have a highly engaged youth population in agroecology.
- **Moderate Interest in LRR and NBR**: Both regions show relatively moderate interest levels, with **LRR** having the highest proportion of **Interested** youth (27%) and **NBR** showing a combined **Interested** and **Very Interested** rate of 33%.
- **Disengagement in CRR North and URR**: These regions exhibit the highest levels of **Very Uninterested** youth, with **67%** in CRR North and **17%** in URR. This points to significant barriers to interest in these regions, which could be due to a lack of awareness, resources, or perceived benefits of agroecology.

## Figure 45: Youth involvement in the implementation of agroecology






## 4.6: The availability of land for practicing agroecology

The figure provides insights into the **availability of land for practicing agroecology** in various regions, categorized by the responses: **Available**, **Highly Available**, **Highly Unavailable**, **Neutral**, and **Unavailable**. Below is a detailed analysis based on **overall trends** and **regional variations**:

**Overall Analysis:**

- **Available (51%)**: More than half of respondents across all regions report that land is **Available** for practicing agroecology, suggesting that access to land is generally not a significant barrier.
- **Highly Available (19%)**: A smaller percentage of respondents (19%) consider land to be **Highly Available**, indicating that there are regions where access to land is plentiful, but this is not widespread across all regions.
- **Unavailable (16%)**: While the overall percentage of respondents indicating that land is **Unavailable** is relatively low (16%), it still represents a notable challenge in certain areas.
- **Neutral (10%)**: A small portion of respondents remain **Neutral**, suggesting either indifference or uncertainty about the availability of land for agroecology.

- **Highly Unavailable (3%)**: Very few respondents feel that land is **Highly Unavailable**, indicating that extreme land scarcity is not a widespread issue.

**Regional Analysis:**

- **CRR North**:
    - **Available (49%)**: Nearly half of the respondents in CRR North report that land is **Available**, reflecting moderate access to land for agroecology practices.
    - **Highly Available (1%)**: A very small percentage finds land to be **Highly Available**, indicating that while land is accessible, it is not abundant.
    - **Unavailable (22%)**: A significant portion (22%) report that land is **Unavailable**, indicating some difficulties in accessing land for agroecology in this region.
    - **Neutral (14%)** and **Highly Unavailable (14%)**: These responses suggest that there is uncertainty or mixed perceptions about land availability in CRR North, and a portion of the population experiences severe land scarcity.
- **CRR South**:
    - **Available (31%)** and **Highly Available (34%)**: CRR South stands out with a high combined percentage of **Available** and **Highly Available** responses (65%), indicating that land access is generally not a major issue in this region.
    - **Unavailable (29%)**: However, a notable 29% find land **Unavailable**, suggesting that there are pockets of land scarcity or challenges despite the high overall availability.
    - **Neutral (6%)**: A small percentage remain neutral, likely reflecting uncertainty or a lack of knowledge about land access.
- **LRR**:
    - **Available (31%)** and **Highly Available (47%)**: With a combined 78%, LRR has the highest proportion of respondents indicating that land is readily available, with nearly half reporting it as **Highly Available**.
    - **Unavailable (10%)** and **Neutral (11%)**: These figures are relatively low, indicating that land scarcity is not a significant issue in LRR, and most people have positive perceptions of land availability.
- **NBR**:
    - **Available (68%)** and **Highly Available (8%)**: NBR shows a strong trend of land availability, with the vast majority of respondents reporting that land is **Available** for agroecology practices.
    - **Unavailable (16%)**: However, 16% report that land is **Unavailable**, indicating that some areas may still face challenges.

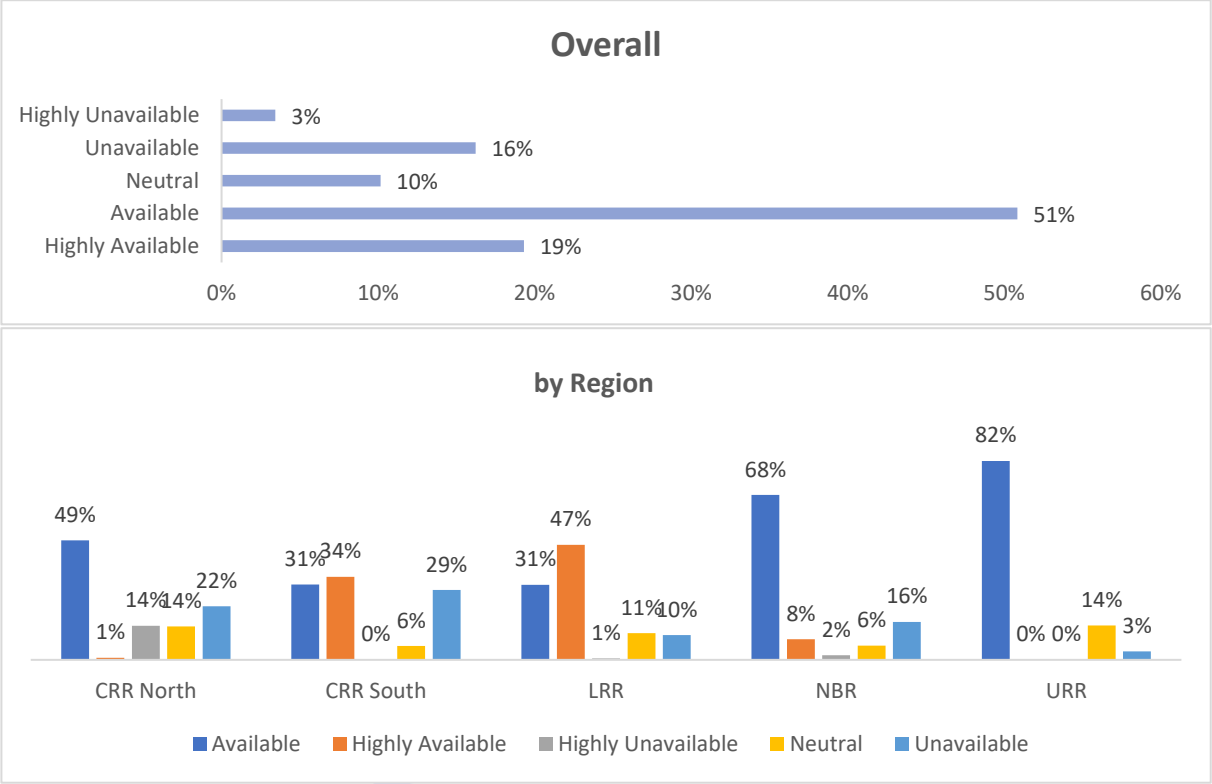
- **Neutral (6%)** and **Highly Unavailable (2%)**: These figures suggest that while most respondents have access to land, a small portion remains uncertain or face significant land constraints.

- **URR**:
  - **Available (82%)**: URR has the highest percentage of respondents reporting that land is **available**, indicating that land access is not a major challenge in this region.
  - **Neutral (14%)**: A notable portion of respondents remains **Neutral**, suggesting some uncertainty or a lack of engagement with land access issues.
  - **Unavailable (3%)**: Only a small percentage report that land is **Unavailable**, reinforcing the notion that land access is generally not a significant issue in URR.

**Conclusion:**

- **High Land Availability in URR, NBR, and LRR**: URR (82%), NBR (68%), and LRR (78%) all report high levels of land availability, suggesting that these regions are well-positioned for agroecology practices, with minimal barriers related to land access.
- **Mixed Results in CRR North and CRR South**: CRR South shows high levels of **Highly Available** land (34%) but also has a relatively high percentage of **Unavailable** responses (29%). CRR North presents a more balanced but less favorable picture, with **49%** of respondents reporting that land is available, but a significant portion (22%) finds land **Unavailable**.
- **Minimal Extreme Land Scarcity**: Across all regions, only a small percentage of respondents report land as **Highly Unavailable** (3%), indicating that extreme land scarcity is not a widespread issue, though it may be a localized challenge in some areas.

## Figure 46: The availability of land for practicing agroecology






## 4.7: Frequently do you use pesticides in agroecology practices

The figure presents data on the **frequency of pesticide use** in agroecology practices across different regions, categorized by the responses: **Always**, **Never**, **Often**, **Rarely**, and **Sometimes**. Below is an analysis based on the **overall trend** and **regional variations** in pesticide usage.

**Overall Analysis:**

- **Never (42%)**: The majority of respondents across all regions report that they **Never** use pesticides in agroecology practices, which aligns with the principles of agroecology that prioritize minimal or no use of chemical inputs.
- **Sometimes (26%)**: A notable portion of respondents use pesticides **Sometimes**, suggesting that although pesticides are not regularly used, there are instances where they might be applied in certain situations.
- **Rarely (25%)**: One-quarter of the respondents report **Rarely** using pesticides, indicating that while pesticides are not commonly used, they are still employed occasionally in some cases.

- **Often (5%)** and **Always (2%)**: A small percentage of respondents use pesticides **Often** or **Always**, reflecting a minority that integrates pesticide use more frequently into their agroecological practices.

**Regional Analysis:**

- **CRR North**:
    - **Never (63%)**: A significant majority in CRR North report that they **Never** use pesticides, suggesting strong adherence to agroecological principles in this region.
    - **Sometimes (19%)** and **Rarely (12%)**: There is a notable minority who use pesticides either **Sometimes** or **Rarely**, indicating that there are occasional applications of pesticides, but they are not frequent.
    - **Always (4%)** and **Often (3%)**: A very small percentage report using pesticides **Always** or **Often**, reflecting minimal frequent pesticide use in CRR North.
- **CRR South**:
    - **Never (49%)**: About half of the respondents in CRR South indicate that they **Never** use pesticides, showing a relatively high avoidance of chemical inputs in agroecology.
    - **Rarely (28%)** and **Sometimes (20%)**: A considerable proportion of respondents report using pesticides **Rarely** or **Sometimes**, suggesting that while pesticides are not commonly used, there is some flexibility in their application when necessary.
    - **Always (1%)** and **Often (1%)**: Very few respondents use pesticides **Always** or **Often**, indicating minimal frequent pesticide use in this region.
- **LRR**:
    - **Never (42%)**: Similar to CRR South, 42% of respondents in LRR report **Never** using pesticides, which is a relatively high percentage but not the majority.
    - **Rarely (33%)** and **Sometimes (22%)**: A significant portion of respondents use pesticides either **Rarely** or **Sometimes**, suggesting that while pesticide use is not the norm, it is still occasionally integrated into agroecological practices.
    - **Always (0%)** and **Often (3%)**: Very few respondents use pesticides **Often**, and no respondents report using pesticides **Always**, indicating minimal reliance on chemical inputs.
- **NBR**:
    - **Never (20%)**: In NBR, only 20% of respondents report **Never** using pesticides, which is the lowest among all regions. This suggests that pesticide use is more prevalent in NBR compared to other regions.
    - **Sometimes (44%)** and **Rarely (26%)**: A large portion of respondents use pesticides either **Sometimes** or **Rarely**, indicating that occasional pesticide use is relatively common in NBR.

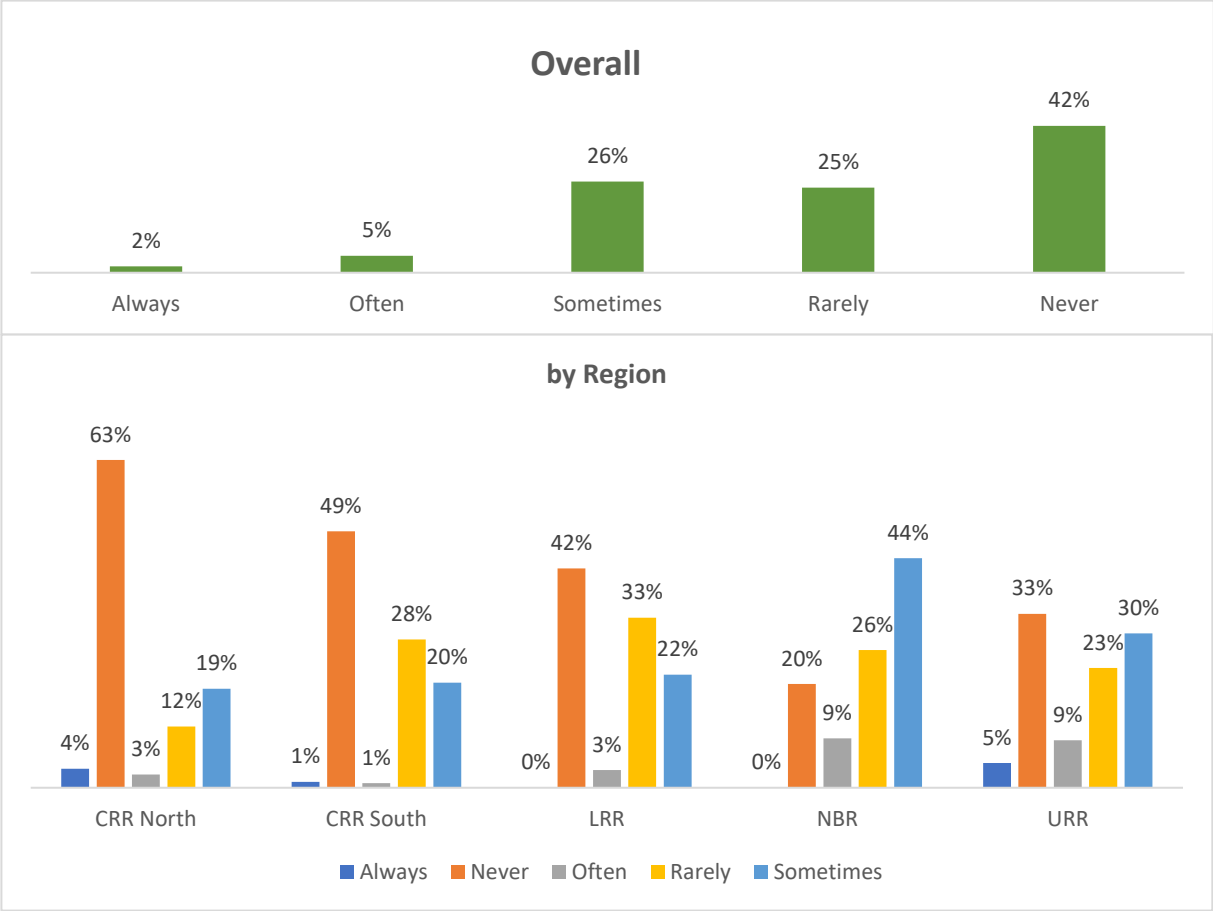
- **Often (9%)**: A higher percentage of respondents in NBR use pesticides **Often**, reflecting a more frequent reliance on chemical inputs compared to other regions.
- **Always (0%)**: No respondents report **Always** using pesticides, indicating that while pesticide use is more frequent in NBR, it is not a consistent practice.

- **URR**:
  - **Never (33%)**: In URR, one-third of respondents report **Never** using pesticides, reflecting moderate avoidance of chemical inputs.
  - **Sometimes (30%)** and **Rarely (23%)**: A significant portion of respondents use pesticides either **Sometimes** or **Rarely**, indicating that while pesticide use is not a constant practice, it is still fairly common.
  - **Often (9%)** and **Always (5%)**: URR has the highest percentage of respondents reporting **Always** or **Often** using pesticides, indicating that pesticide use is more frequent in this region compared to others.

**Conclusion:**

- **Majority Avoid Pesticides**: Overall, **42%** of respondents across all regions report that they **Never** use pesticides in agroecology practices, which aligns with the principles of agroecology that emphasize reducing chemical inputs. However, this still leaves a significant portion of respondents who use pesticides to some extent.
- **Occasional Use Common**: A notable portion of respondents use pesticides **Sometimes (26%)** or **Rarely (25%)**, indicating that while pesticides are not a regular part of agroecology, they are occasionally employed in certain situations.
- **More Frequent Use in NBR and URR**: NBR and URR stand out as regions where pesticide use is more frequent. In NBR, **44%** of respondents report using pesticides **Sometimes**, and **9%** report using them **Often**, while in URR, **9%** report using pesticides **Often** and **5%** report using them **Always**. This suggests that agroecological practices in these regions may be more flexible in their approach to pesticide use.
- **Strong Avoidance in CRR North**: CRR North has the highest percentage of respondents reporting that they **Never** use pesticides (63%), reflecting a strong adherence to agroecological principles in this region.

## Figure 47: Frequently do you use pesticides in agroecology practices






## 4.8: Rate the knowledge of extension workers in agroecology

The figure presents the knowledge ratings of extension workers in agroecology across different regions, categorized into responses: Highly Knowledgeable, Highly Not Knowledgeable, Knowledgeable, Neutral, and Not Knowledgeable. Below is an analysis based on the overall trend and regional variations in knowledge levels.

**Overall Analysis:**

- **Highly Knowledgeable (3%)**: A very small percentage of respondents across all regions feel Highly Knowledgeable about agroecology, indicating a significant gap in advanced understanding.
- **Knowledgeable (32%)**: A modest portion considers themselves Knowledgeable, suggesting that while some have a reasonable grasp, there is still a large segment that may require additional training.
- **Neutral (49%)**: Nearly half of the respondents are Neutral, implying uncertainty or a lack of confidence in their knowledge of agroecology practices.

- **Not Knowledgeable (9%)**: A notable proportion feels Not Knowledgeable, highlighting a clear need for education and capacity building.
- **Highly Not Knowledgeable (7%)**: This indicates a concerning number of individuals who feel they lack fundamental knowledge about agroecology.

**Regional Analysis:**

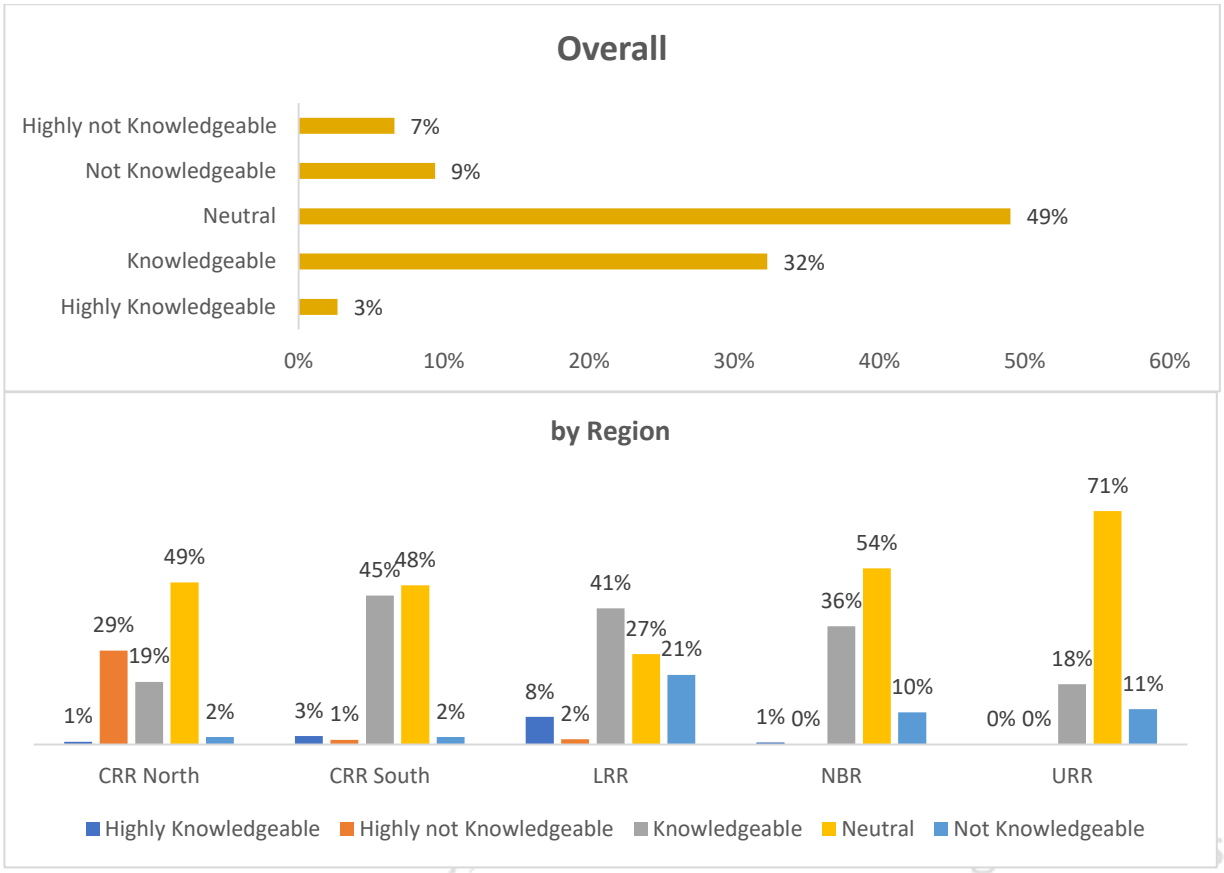
- **CRR North**:
    - **Highly Knowledgeable (1%)**: Very few extension workers rate themselves as Highly Knowledgeable, indicating a significant area for improvement.
    - **Knowledgeable (19%)**: A small percentage considers themselves Knowledgeable, suggesting that many may need further support.
    - **Neutral (49%)**: A high Neutral rate indicates many workers are unsure of their knowledge level, signaling a potential for targeted training.
    - **Highly Not Knowledgeable (29%) & Not Knowledgeable (2%)**: The high percentage of those feeling Highly Not Knowledgeable suggests urgent training needs in this region.
- **CRR South**:
    - **Highly Knowledgeable (3%)**: Slightly higher than CRR North, but still low overall.
    - **Knowledgeable (45%)**: A significant number rate themselves as Knowledgeable, indicating better awareness.
    - **Neutral (48%)**: Similar to CRR North, with nearly half feeling uncertain about their knowledge.
    - **Highly Not Knowledgeable (1%) & Not Knowledgeable (2%)**: Minimal feelings of inadequacy, which is a positive indicator for this region.
- **LRR**:
    - **Highly Knowledgeable (8%)**: This region has a higher percentage of Highly Knowledgeable individuals.
    - **Knowledgeable (41%)**: A strong majority feel knowledgeable, reflecting a better understanding of agroecological practices.
    - **Neutral (27%)**: Fewer are Neutral compared to other regions, suggesting more clarity about their knowledge levels.
    - **Highly Not Knowledgeable (2%) & Not Knowledgeable (21%)**: Knowledge gaps still exist but are less pronounced.

- **NBR**:
    - **Highly Knowledgeable (1%)**: Similar to CRR North, indicating limited high-level knowledge.
    - **Knowledgeable (36%)**: A reasonable portion feels Knowledgeable, yet there is room for improvement.
    - **Neutral (54%)**: The highest Neutral percentage, signaling uncertainty among many extension workers.
    - **Highly Not Knowledgeable (0%) & Not Knowledgeable (10%)**: A small percentage expresses feelings of inadequacy.
- **URR**:
    - **Highly Knowledgeable (0%)**: No respondents consider themselves Highly Knowledgeable, raising concern.
    - **Knowledgeable (18%)**: Low knowledge ratings suggest a need for educational interventions.
    - **Neutral (71%)**: A significant majority remain Neutral, indicating a lack of confidence or clarity in their knowledge.
    - **Highly Not Knowledgeable (0%) & Not Knowledgeable (11%)**: No strong feelings of inadequacy, but still highlighting knowledge gaps.

**Conclusion:**

- **Need for Education**: Overall, only 3% of respondents feel Highly Knowledgeable about agroecology, highlighting a clear need for educational initiatives.
- **Potential for Growth**: The high Neutral percentage (49%) indicates that many workers are uncertain about their knowledge, presenting an opportunity for targeted training to enhance their understanding and confidence.
- **Regional Variability**: CRR North and URR show particularly low knowledge levels, necessitating focused efforts in these areas to improve expertise among extension workers.
- **Actionable Insights**: Structured training programs and capacity-building initiatives are essential to enhance the knowledge of extension workers in agroecology, particularly in regions where knowledge levels are low.

## Figure 48: Rate the knowledge of extension workers in agroecology




## 4.9: Women in the implementation of agroecology practice

The figure presents women's empowerment in the implementation of agroecology practices across different regions, categorized into responses: Disempowered, Empowered, Highly Disempowered, Highly Empowered, and Neutral. Below is an analysis based on the overall trend and regional variations.

**Overall Analysis:**

- **Empowered (39%)**: A significant portion of women across all regions feel Empowered in agroecology, indicating a positive trend toward women's active involvement and decision-making.
- **Disempowered (35%)**: However, a considerable percentage of women still feel Disempowered, highlighting that challenges remain in achieving full participation.
- **Neutral (12%)**: A moderate number of women remain Neutral, suggesting ambivalence or limited involvement in decision-making processes.

- **Highly Empowered (3%)**: Only a small percentage of women feel Highly Empowered, indicating that while some women are in positions of strong influence, it is still uncommon.
- **Highly Disempowered (11%)**: A noteworthy percentage of women feel Highly Disempowered, signaling areas where structural barriers may be hindering their full participation in agroecology.

**Regional Analysis:**

- **CRR North**:
    - **Empowered (45%)**: The majority of women feel Empowered, reflecting strong participation in agroecology practices.
    - **Disempowered (31%)**: A significant portion still feel Disempowered, indicating that there are barriers to inclusion.
    - **Highly Empowered (2%)**: Only a small fraction of women feel Highly Empowered, suggesting limited leadership roles.
    - **Highly Disempowered (15%)**: A noticeable proportion of women feel Highly Disempowered, showing that some face significant barriers to empowerment.
    - **Neutral (8%)**: A small percentage remain Neutral, indicating ambivalence or limited involvement.
- **CRR South**:
    - **Empowered (44%)**: Nearly half of the women feel Empowered, indicating strong involvement.
    - **Disempowered (28%)**: A smaller portion feel Disempowered, though challenges still exist.
    - **Highly Empowered (6%)**: A higher percentage of women report feeling Highly Empowered compared to other regions, reflecting more leadership opportunities.
    - **Highly Disempowered (11%)**: A smaller percentage feel Highly Disempowered, though it remains a concern.
    - **Neutral (11%)**: A moderate number of women feel Neutral, suggesting limited engagement for some.
- **LRR**:
    - **Empowered (41%)**: A strong portion of women feel Empowered in LRR, though it is slightly lower than CRR regions.
    - **Disempowered (30%)**: A significant portion feel Disempowered, indicating that barriers persist.

- **Highly Empowered (5%)**: A higher percentage feel Highly Empowered, suggesting better access to leadership roles.
- **Highly Disempowered (16%)**: A considerable portion feel Highly Disempowered, indicating challenges to inclusion.
- **Neutral (7%)**: A small percentage feel Neutral, suggesting that most women have a clearer sense of their role.

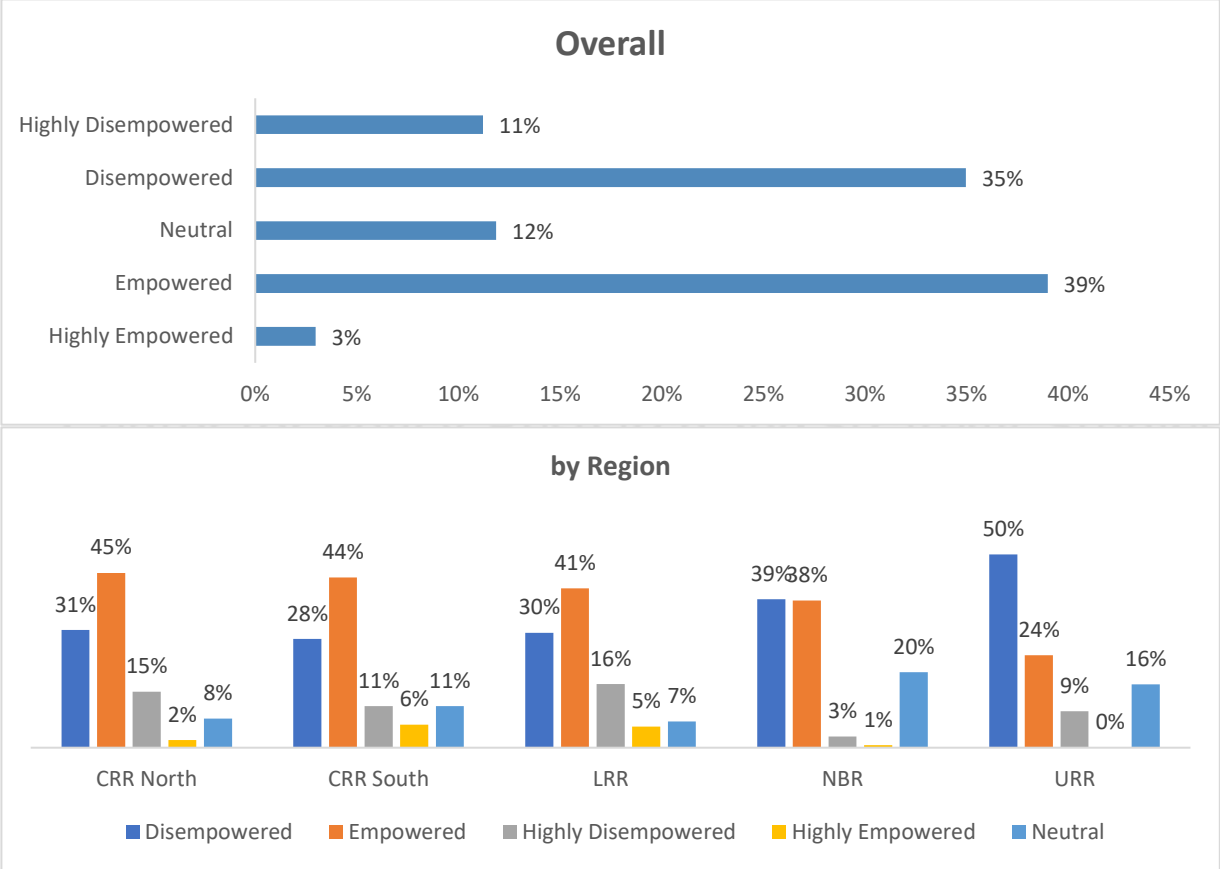
- **NBR**:
  - **Empowered (38%)**: Less than 40% feel Empowered, indicating that women's involvement is lower in this region.
  - **Disempowered (39%)**: The highest percentage of Disempowered women, highlighting significant challenges.
  - **Highly Empowered (1%)**: Only a very small number feel Highly Empowered, reflecting a lack of leadership positions for women.
  - **Highly Disempowered (3%)**: The smallest percentage of Highly Disempowered women, indicating fewer severe challenges but still present.
  - **Neutral (20%)**: The highest percentage of Neutral responses, indicating that many women feel ambivalent about their roles.
- **URR**:
  - **Empowered (24%)**: The lowest percentage of Empowered women, suggesting that women's involvement in agroecology is limited in URR.
  - **Disempowered (50%)**: Half of the women feel Disempowered, reflecting significant barriers to participation.
  - **Highly Empowered (0%)**: No women feel Highly Empowered, showing a lack of leadership opportunities for women in this region.
  - **Highly Disempowered (9%)**: A moderate percentage feel Highly Disempowered, indicating serious challenges.
  - **Neutral (16%)**: A significant portion remain Neutral, signaling disengagement or lack of awareness of their role.

**Conclusion:**

- **Regional Disparities in Empowerment**: Across all regions, only 39% of women feel Empowered, showing that while progress has been made, many women still face challenges in fully participating in agroecology. CRR North and South show relatively higher levels of empowerment, while URR lags behind with the highest disempowerment levels.

- **Barriers to Leadership**: The percentage of Highly Empowered women remains low overall (3%), highlighting a gap in leadership opportunities for women in agroecology. This is particularly evident in regions like URR and NBR, where women's involvement in decision-making appears to be limited.
- **Persistent Disempowerment**: The high percentage of Disempowered (35%) and Highly Disempowered (11%) women indicates that barriers such as access to resources, decision-making power, and social norms continue to hinder women's full participation.
- **Opportunities for Improvement**: To improve women's involvement, regions like URR and NBR, which show higher levels of disempowerment, may require targeted interventions such as capacity building, leadership training, and policies to ensure greater inclusivity and empowerment for women in agroecology practices.

**Figure 49: Women in the implementation of agroecology practice**




## 4.10: Land tenure system affect the implementation of agroecology

The figure presents the perceptions of respondents on how the land tenure system affects the implementation of agroecology practices across different regions, categorized into responses: Negative, Neutral, Positive, Strongly Negative, and Strongly Positive. Below is an analysis based on the overall trend and regional variations.

**Overall Analysis:**

- **Positive (43%)**: A significant portion of respondents across all regions view the land tenure system as having a positive effect on the implementation of agroecology. This suggests that in many areas, land ownership structures are supportive of sustainable farming practices.
- **Negative (23%)**: Nearly a quarter of the respondents believe the land tenure system negatively affects agroecology implementation, highlighting challenges related to land access and security.
- **Neutral (23%)**: A considerable number of respondents are neutral on this issue, indicating that land tenure is not perceived as a major factor in agroecology practices by some.
- **Strongly Negative (6%)**: A small percentage of respondents express strong dissatisfaction with the land tenure system, suggesting significant obstacles to implementing agroecological practices in certain regions.
- **Strongly Positive (5%)**: Only a small percentage of respondents are strongly positive, showing that while many find the system supportive, few consider it ideal for agroecology.

**Regional Analysis:**

- **CRR North**:
    - **Negative (32%)**: A significant portion of respondents in CRR North feel that the land tenure system negatively affects agroecology implementation, indicating challenges such as limited land rights or insecure land tenure.
    - **Neutral (31%)**: A large percentage remain neutral, reflecting uncertainty or ambivalence about the system's impact on agroecology.
    - **Positive (10%)**: Only a small portion see the system as beneficial, indicating limited support for agroecology.
    - **Strongly Negative (25%)**: A quarter of respondents feel strongly that the land tenure system poses serious barriers to agroecology, reflecting deep dissatisfaction.
    - **Strongly Positive (3%)**: A very small percentage express strong satisfaction, showing that some respondents do benefit from the land tenure system.
- **CRR South**:
    - **Positive (65%)**: The majority of respondents in CRR South view the land tenure system as supportive of agroecology, suggesting that land access and security are not major issues in this region.
    - **Negative (14%)**: Only a small portion of respondents express negative views, indicating fewer challenges compared to other regions.
    - **Neutral (11%)**: A few respondents remain neutral, suggesting the system's impact is not universally felt.

- **Strongly Positive (10%)**: A notable portion strongly believes that the land tenure system is highly supportive of agroecology, reflecting a favorable environment for these practices.
- **Strongly Negative (1%)**: Almost no respondents express strong dissatisfaction, indicating minimal challenges related to land tenure in CRR South.

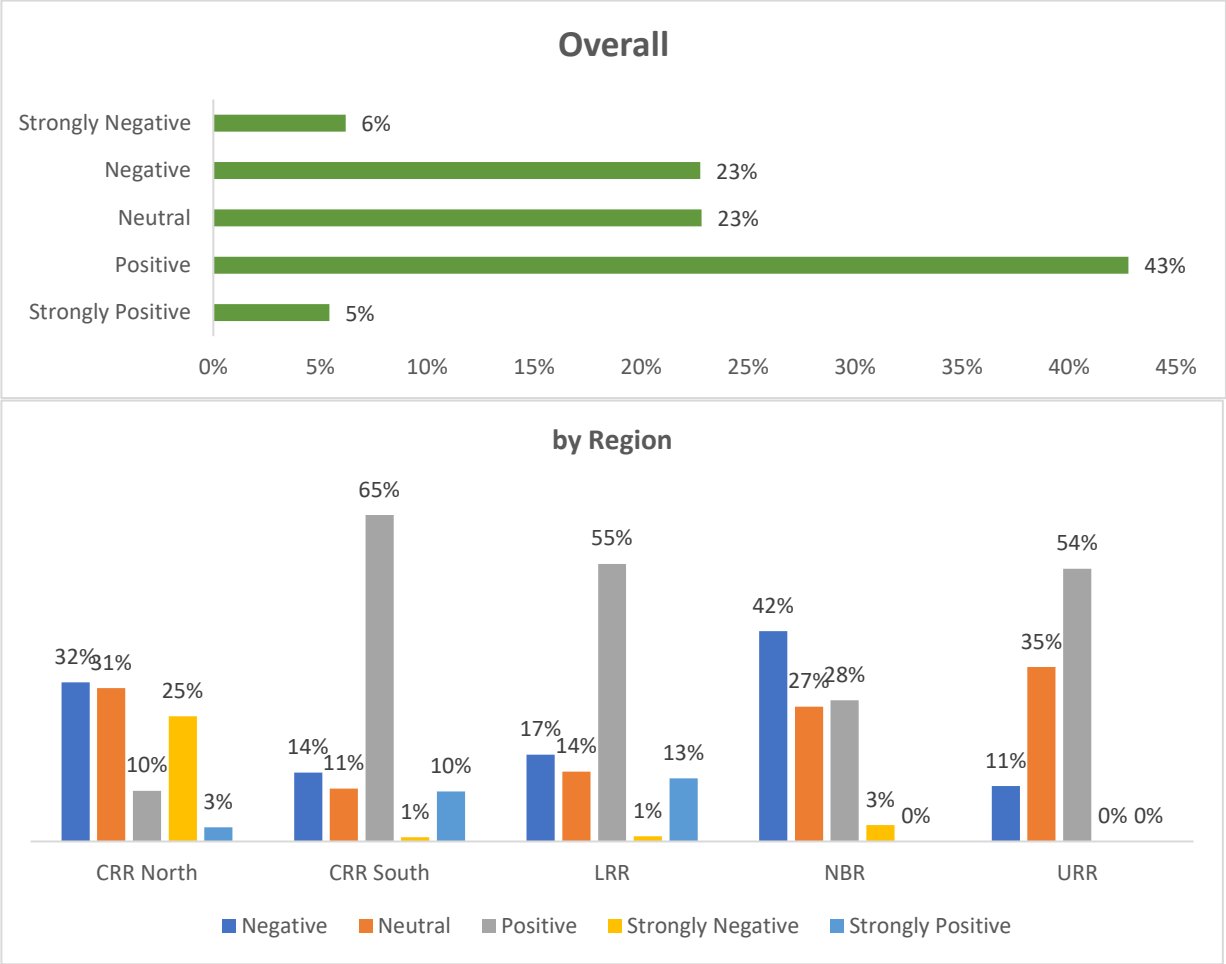
- **LRR**:
  - **Positive (55%)**: More than half of the respondents in LRR feel positively about the land tenure system's impact on agroecology, showing that the system supports sustainable practices.
  - **Negative (17%)**: A smaller portion express negative views, highlighting that while many benefit, some still face challenges.
  - **Neutral (14%)**: A significant number remain neutral, indicating that the system's impact is not clear-cut for everyone.
  - **Strongly Positive (13%)**: A higher percentage of respondents express strong satisfaction, showing that in certain areas, the land tenure system is highly conducive to agroecology.
  - **Strongly Negative (1%)**: Only a few respondents feel strongly that the system poses serious barriers to agroecology.
- **NBR**:
  - **Negative (42%)**: The largest proportion of respondents in NBR believe the land tenure system negatively affects agroecology, suggesting serious challenges related to land ownership or security in this region.
  - **Neutral (27%)**: A significant portion remain neutral, reflecting mixed or unclear perceptions of the system's impact.
  - **Positive (28%)**: Less than a third of respondents feel the system supports agroecology, showing limited benefits.
  - **Strongly Negative (3%)**: A small percentage express strong dissatisfaction, reinforcing that land tenure issues are more pronounced here.
  - **Strongly Positive (0%)**: No respondents express strong satisfaction with the system, indicating widespread dissatisfaction or challenges.
- **URR**:
  - **Positive (54%)**: A majority of respondents in URR see the land tenure system as beneficial for agroecology, suggesting that land access and security support sustainable practices.
  - **Neutral (35%)**: A significant portion remain neutral, indicating that the system may not be a major factor for many respondents.

- **Negative (11%)**: Only a small percentage express negative views, showing limited dissatisfaction with the system.
- **Strongly Negative (0%) and Strongly Positive (0%)**: No respondents feel strongly either way, suggesting that while the system may generally be supportive, it does not inspire strong opinions.

**Conclusion:**

- **Positive Overall View (43%)**: Across all regions, a significant portion of respondents view the land tenure system positively in relation to agroecology implementation, indicating that land ownership and security structures are generally conducive to sustainable practices.
- **Challenges in Some Regions**: Regions like CRR North (32%) and NBR (42%) stand out for their high percentages of respondents who feel the land tenure system negatively impacts agroecology. These regions may face issues such as insecure land rights or inequitable access to land, which hinder agroecological practices.
- **CRR South and URR Lead in Positive Perceptions**: CRR South (65%) and URR (54%) show the highest percentages of respondents who feel positively about the land tenure system's role in agroecology. These regions may have more favorable land policies or practices that support sustainable agriculture.
- **Limited Strong Opinions**: Overall, there are relatively few respondents who express strong opinions (either positive or negative), suggesting that while land tenure is an important factor, it is not seen as the primary barrier or enabler of agroecology implementation for most respondents.

## Figure 50: Land tenure system affect the implementation of agroecology




## 4.11: Deforestation a constraint to agroecology

The figure reflects respondents' views on deforestation as a constraint to agroecology across different regions, categorized by levels of impact: Very High, High, Moderate, Low, and Very Low. Below is an analysis based on the overall trends and regional variations.

**Overall Analysis:**

- **Very High (57%)**: The majority of respondents across all regions perceive deforestation as having a "Very High" impact on agroecology, indicating that deforestation is widely seen as a significant constraint to sustainable farming practices.
- **High (19%)**: A considerable portion of respondents feel that deforestation has a "High" impact, further highlighting the seriousness of this issue.
- **Moderate (14%)**: A smaller but notable group views deforestation as having a "Moderate" impact, suggesting that while it is a concern, it may not be as severe in certain areas.

- **Low (9%)**: A minor percentage of respondents consider deforestation to have a "Low" impact, indicating that in some regions, it may not be seen as a major constraint.
- **Very Low (1%)**: Almost no respondents view deforestation as having a "Very Low" impact, showing that it is generally seen as a significant issue across all regions.

**Regional Analysis:**

- **CRR North**:
    - **Very High (56%)**: Over half of the respondents in CRR North perceive deforestation as having a very high impact on agroecology, indicating that it is a major constraint in this region.
    - **High (15%)**: A significant portion of respondents also rate the impact as high, reinforcing the notion that deforestation poses serious challenges to sustainable agriculture here.
    - **Moderate (15%)**: An equal percentage of respondents view the impact as moderate, suggesting that while deforestation is a concern, it may not be uniformly severe across the region.
    - **Low (9%)** and **Very Low (5%)**: A small percentage of respondents see the impact as low or very low, indicating that in some areas, deforestation might not be as pressing an issue.
- **CRR South**:
    - **Very High (56%)**: Similar to CRR North, over half of the respondents in CRR South view deforestation as having a very high impact on agroecology, signaling that it is a critical issue in this region.
    - **High (19%)**: A notable portion also sees the impact as high, further emphasizing the severity of deforestation as a constraint.
    - **Moderate (23%)**: A larger percentage of respondents in CRR South view the impact as moderate, suggesting that while deforestation is a challenge, its severity may vary across different parts of the region.
    - **Low (0%) and Very Low (1%)**: Almost no respondents rate the impact as low or very low, indicating that the issue is widely recognized as significant.
- **LRR**:
    - **Very High (84%)**: The vast majority of respondents in LRR believe that deforestation has a very high impact on agroecology, suggesting that the region faces significant deforestation challenges that hinder sustainable farming practices.
    - **High (9%)**: A smaller portion sees the impact as high, reinforcing the notion that deforestation is a major issue.
    - **Moderate (5%)**: Only a few respondents rate the impact as moderate, indicating that deforestation is overwhelmingly seen as a severe constraint in this region.

- **Low (2%)**: A minimal percentage view deforestation as having a low impact, and no respondents rate it as very low, reflecting widespread concern.

- **NBR**:
  - **High (36%)**: The highest percentage of respondents in NBR view deforestation as having a high impact, suggesting that while it is a significant issue, it may not be perceived as extreme compared to other regions.
  - **Moderate (27%)**: A considerable portion of respondents rate the impact as moderate, indicating that deforestation is recognized as a constraint, but not uniformly severe.
  - **Low (30%)**: A notable percentage of respondents view the impact as low, reflecting that in some areas of NBR, deforestation may not be as pressing an issue.
  - **Very High (7%)**: Only a small percentage believe that deforestation has a very high impact, further illustrating that its severity is less pronounced in NBR compared to other regions.
  - **Very Low (0%)**: No respondents in NBR view deforestation as having a very low impact.
- **URR**:
  - **Very High (74%)**: A large majority of respondents in URR see deforestation as having a very high impact on agroecology, indicating that it is a major challenge for sustainable practices in this region.
  - **High (18%)**: A significant portion also views the impact as high, reinforcing the seriousness of deforestation as a constraint in URR.
  - **Low (7%)**: A small percentage of respondents rate the impact as low, suggesting that there may be areas within URR where deforestation is less of an issue.
  - **Moderate (0%) and Very Low (0%)**: No respondents rate the impact as moderate or very low, indicating widespread recognition of deforestation as a critical issue.

**Conclusion:**

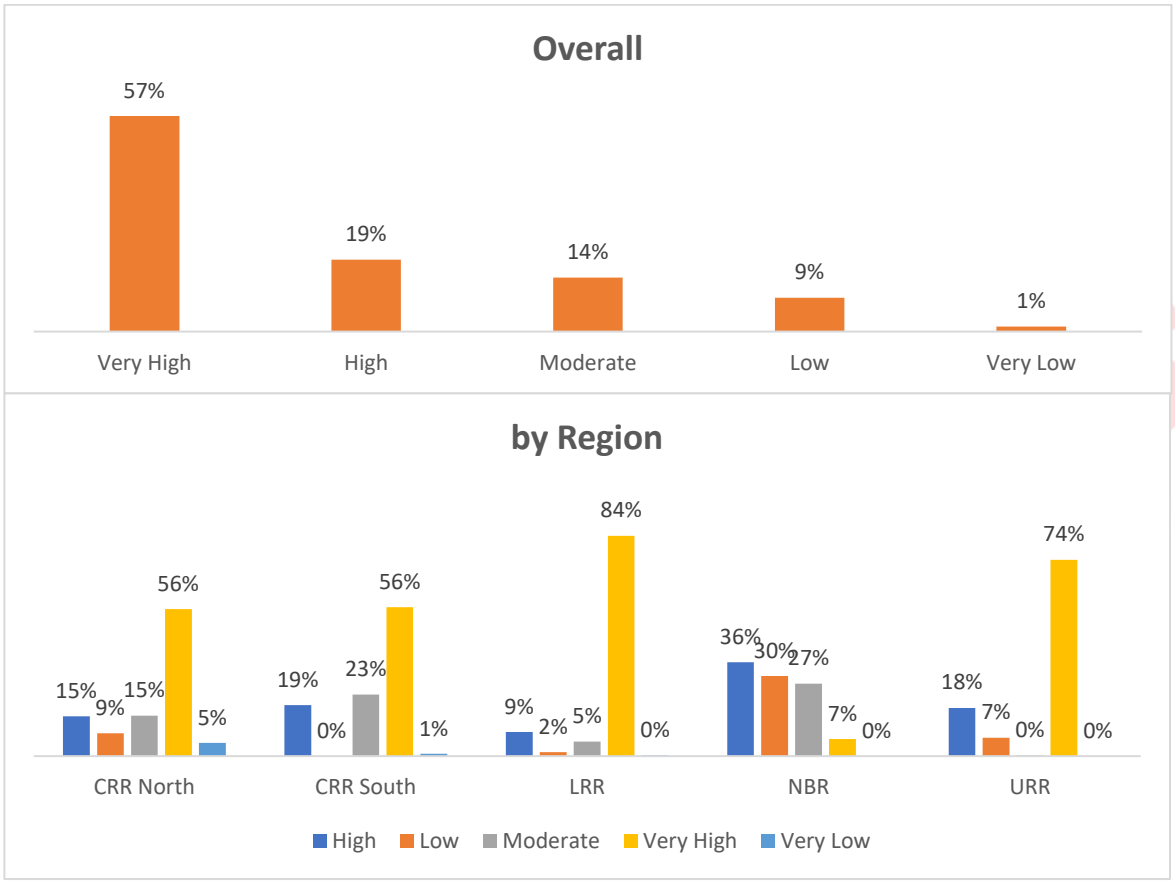
- **Widespread Concern About Deforestation**: Across all regions, a majority of respondents (57%) believe that deforestation has a "Very High" impact on agroecology, indicating that it is a critical constraint to sustainable farming practices. An additional 19% view the impact as "High," reinforcing the widespread concern.
- **Regional Variations**:
  - **LRR (84%)** and **URR (74%)** stand out for having the highest percentages of respondents who believe that deforestation has a very high impact, suggesting that these regions face the most severe deforestation challenges.
  - **NBR** presents a more mixed view, with a relatively lower percentage (7%) rating the impact as "Very High" and a notable portion (30%) considering the impact

"Low." This suggests that deforestation may not be uniformly perceived as a major constraint across the region.

- **CRR North** and **CRR South** both report similarly high levels of concern, with over 50% of respondents in both regions rating the impact as "Very High." However, CRR South shows more moderate views, with 23% of respondents seeing the impact as "Moderate."

- **Minimal Perception of Low Impact**: Only a small percentage of respondents (9%) view deforestation as having a "Low" or "Very Low" impact, highlighting that it is generally seen as a significant issue across all regions.

### Figure 51: Deforestation a constraint to agroecology




## 4.12: Salinization as a challenge to agroecology

The figure provides insights into the perception of salinization as a challenge to agroecology across various regions. The responses are categorized by the perceived significance: Very Significant, Significant, Neutral, Insignificant, and Very Insignificant.

**Overall Analysis:**

- **Insignificant (39%)**: A large portion of respondents overall view salinization as an insignificant challenge to agroecology. This suggests that for many, salinization is not seen as a major issue in their agroecological practices.
- **Very Insignificant (21%)**: A further 21% of respondents see salinization as a very insignificant challenge, reinforcing the idea that, for the majority, this issue does not pose a substantial threat.
- **Significant (18%)**: A smaller percentage of respondents consider salinization to be a significant challenge. This group recognizes the potential negative impact of salinization on agroecology, but they are in the minority.
- **Very Significant (12%)**: A smaller portion of respondents regard salinization as a very significant challenge, indicating that while not widespread, there are regions where salinization has a considerable impact on agroecological practices.
- **Neutral (10%)**: A minimal percentage of respondents are neutral on this issue, suggesting that most have a clear opinion on the impact of salinization.

**Regional Analysis:**

- **CRR North**:
    - **Insignificant (37%)**: A significant proportion of respondents in CRR North view salinization as an insignificant challenge, indicating that this issue is not a major concern in the region.
    - **Very Insignificant (22%)**: Nearly a quarter of respondents consider salinization to be a very insignificant problem, further downplaying its impact in CRR North.
    - **Neutral (13%)**: A small percentage are neutral, reflecting some uncertainty about the severity of salinization in the region.
    - **Very Significant (20%)**: A notable portion of respondents view salinization as a very significant issue, suggesting that for a minority, it presents a serious challenge.
    - **Significant (8%)**: Only a small percentage regard it as a significant issue, indicating that salinization is not a widespread concern but still affects a portion of the population.
- **CRR South**:
    - **Significant (42%)**: In CRR South, a large portion of respondents see salinization as a significant challenge, indicating that it has a considerable impact on agroecology in this region.
    - **Neutral (19%)**: A sizable group is neutral on the issue, suggesting uncertainty about the severity of salinization in CRR South.
    - **Insignificant (19%)**: An equal percentage of respondents view salinization as insignificant, reflecting a divided perspective on its impact.

- **Very Significant (13%)**: A smaller percentage consider it a very significant challenge, while **Very Insignificant (7%)** responses indicate that salinization is not a pressing issue for some.

- **LRR**:
  - **Very Significant (21%)** and **Significant (26%)**: In LRR, nearly half of the respondents view salinization as either very significant or significant, suggesting that it is a serious challenge in the region.
  - **Very Insignificant (26%)**: Conversely, over a quarter of the respondents see salinization as very insignificant, indicating that opinions on its impact are highly polarized.
  - **Insignificant (21%)**: Another 21% consider it insignificant, further showing the divided views in LRR.
  - **Neutral (6%)**: A small percentage of respondents are neutral, indicating that the majority have a clear stance on salinization.

- **NBR**:
  - **Insignificant (53%)**: The majority of respondents in NBR consider salinization to be an insignificant challenge, suggesting that it is not a major issue in this region.
  - **Very Insignificant (30%)**: A further 30% see it as very insignificant, reinforcing the idea that salinization does not pose a serious threat to agroecology in NBR.
  - **Neutral (10%)**: A small portion are neutral, indicating a general consensus that salinization is not a major concern.
  - **Significant (5%)** and **Very Significant (3%)**: Only a few respondents view it as significant or very significant, further emphasizing that salinization is not widely regarded as an issue in NBR.

- **URR**:
  - **Insignificant (72%)**: In URR, the overwhelming majority of respondents view salinization as insignificant, indicating that it is not a major challenge in this region.
  - **Very Insignificant (22%)**: A further 22% consider it very insignificant, reinforcing the perception that salinization is not a serious issue in URR.
  - **Significant (4%)**: Only a small percentage see salinization as a significant challenge.
  - **Neutral (1%) and Very Significant (1%)**: Almost no respondents are neutral or view it as a very significant challenge, showing a clear consensus that salinization is not a pressing concern in URR.

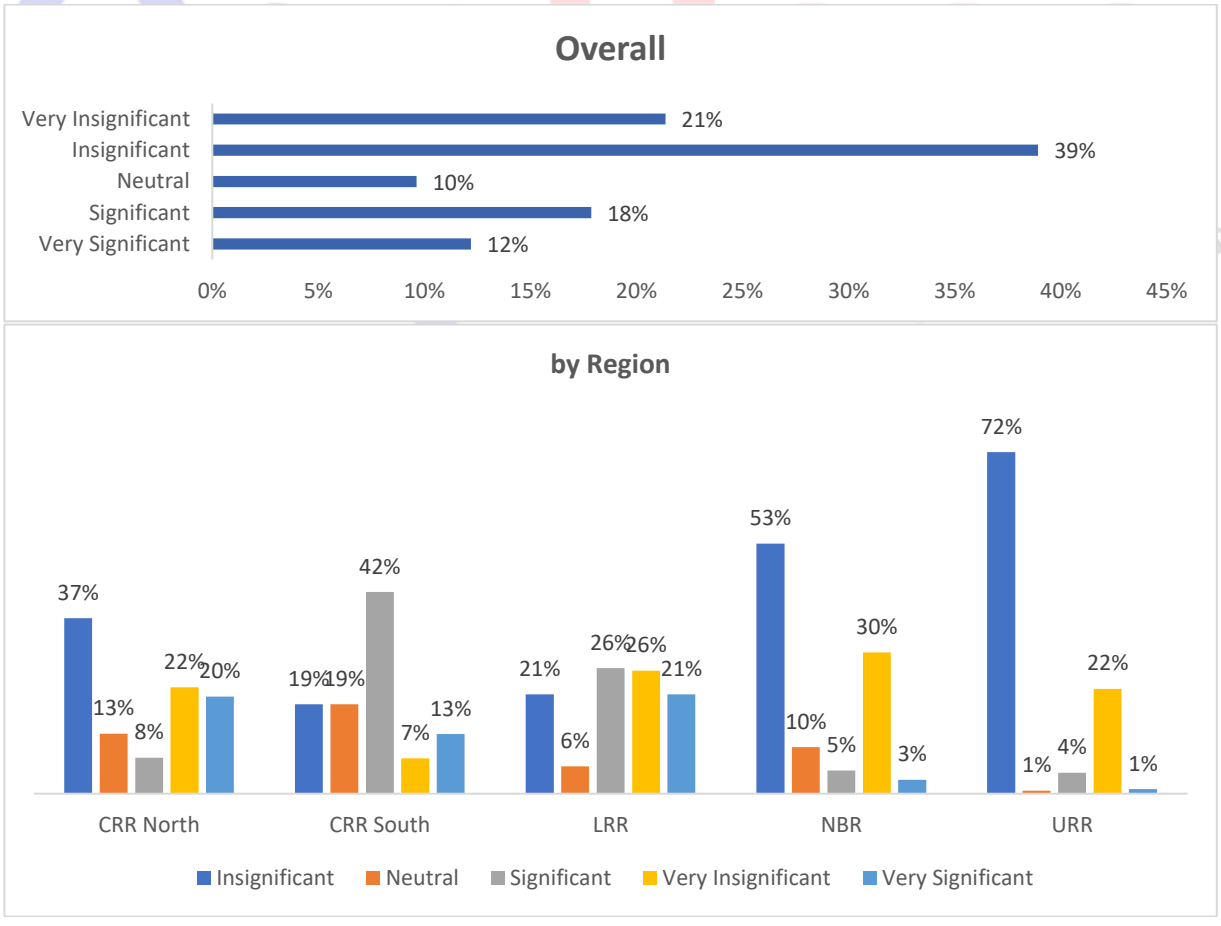
**Conclusion:**

- **Overall Perception**: Across all regions, 60% of respondents view salinization as either insignificant (39%) or very insignificant (21%), indicating that the majority do not see it

as a major constraint to agroecology. Only 30% view it as either significant (18%) or very significant (12%), highlighting that salinization is a localized concern in specific regions.

- **Regional Variations**:
    - **CRR South** and **LRR** stand out as regions where salinization is seen as more of a significant challenge, with over 40% of respondents in CRR South and nearly half in LRR considering it significant or very significant.
    - **NBR** and **URR**, on the other hand, report the highest levels of insignificance, with 83% of respondents in URR and 83% in NBR considering salinization insignificant or very insignificant.
- **Polarized Views**: Particularly in **LRR**, views on the significance of salinization are highly polarized, with nearly equal portions of respondents seeing it as either a significant or insignificant challenge.
- **Minority See It as a Serious Concern**: While salinization is recognized as a serious issue by a minority in some regions, the overall perception is that it is not a widespread constraint to agroecology.

## Figure 52: Salinization as a challenge to agroecology



## 4.13: Soil erosion as a constraint to agroecology

The figure provides insights into how different regions perceive soil erosion as a constraint to agroecology. The responses are categorized by the perceived impact of soil erosion: Very Impactful, Impactful, Slightly Impactful, Neutral, and Not Impactful.

**Overall Analysis:**

- **Impactful (45%)**: Almost half of the respondents across all regions view soil erosion as an impactful challenge to agroecology, indicating widespread recognition of its significance.
- **Slightly Impactful (24%)**: A notable portion of respondents consider soil erosion to be slightly impactful, meaning that while it poses a challenge, it may not be as severe in every instance.
- **Very Impactful (19%)**: A smaller but significant percentage of respondents view soil erosion as a very impactful issue, pointing to serious constraints in certain areas.
- **Neutral (7%)**: A small percentage of respondents are neutral, suggesting some uncertainty or lack of strong opinions about the effects of soil erosion.
- **Not Impactful (5%)**: A minimal portion of respondents consider soil erosion to have no impact on agroecology, indicating that few regions view it as an insignificant problem.

**Regional Analysis:**

- **CRR North**:
    - **Impactful (32%)**: In CRR North, nearly one-third of respondents consider soil erosion to be impactful, indicating that it is a considerable challenge in this region.
    - **Very Impactful (31%)**: Similarly, 31% regard soil erosion as very impactful, suggesting that soil degradation is a critical issue in CRR North.
    - **Slightly Impactful (22%)**: A notable portion find it slightly impactful, implying that while it poses challenges, they may be manageable.
    - **Neutral (10%)** and **Not Impactful (5%)**: A smaller percentage are neutral or consider soil erosion not impactful, indicating that the issue is not uniformly severe in the region.
- **CRR South**:
    - **Impactful (67%)**: The majority of respondents in CRR South view soil erosion as impactful, making it the region where soil erosion is perceived as the most widespread challenge.
    - **Very Impactful (20%)**: A smaller portion see soil erosion as very impactful, but it still reflects a significant constraint.

- **Slightly Impactful (6%)**: A small percentage view it as slightly impactful, while **Neutral (3%)** and **Not Impactful (4%)** responses are minimal, indicating a strong consensus on its negative impact.

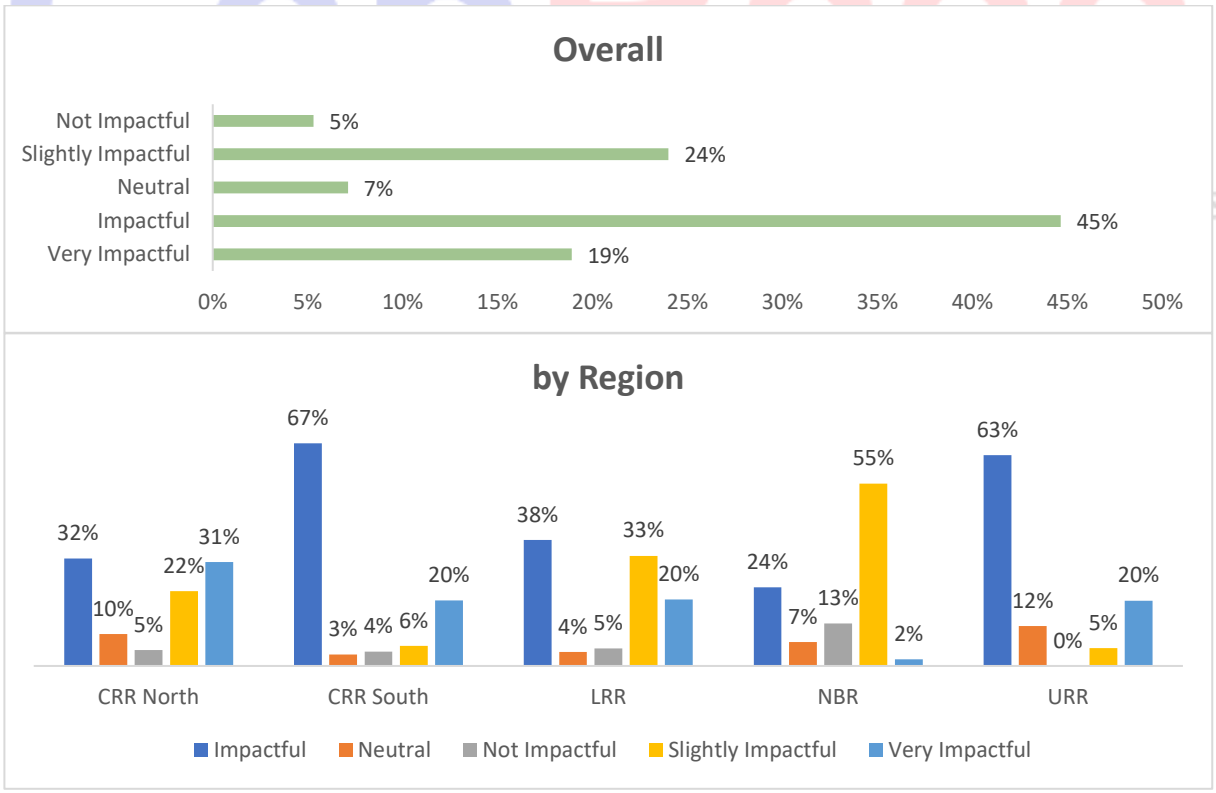
- **LRR**:
  - **Slightly Impactful (33%)**: In LRR, a large portion of respondents regard soil erosion as slightly impactful, suggesting that it is a notable challenge, though not always severe.
  - **Impactful (38%)**: A sizable percentage view soil erosion as impactful, further emphasizing its relevance in LRR.
  - **Very Impactful (20%)**: One-fifth of the respondents find soil erosion very impactful, indicating a serious concern for some.
  - **Neutral (4%)** and **Not Impactful (5%)**: A small percentage view the issue as either neutral or not impactful.
- **NBR**:
  - **Slightly Impactful (55%)**: In NBR, more than half of respondents view soil erosion as slightly impactful, meaning it is acknowledged but not seen as the most pressing concern.
  - **Impactful (24%)**: A smaller portion consider it impactful, while **Very Impactful (2%)** indicates that few see it as a severe problem.
  - **Not Impactful (13%)**: A larger proportion in NBR, compared to other regions, consider soil erosion to be not impactful, indicating that it may not be a major constraint for many.
  - **Neutral (7%)**: A small portion of respondents are neutral.
- **URR**:
  - **Impactful (63%)**: A significant majority in URR view soil erosion as impactful, showing that it is a key constraint to agroecology in the region.
  - **Very Impactful (20%)**: One-fifth of respondents consider it very impactful, indicating that it poses severe challenges in certain areas.
  - **Slightly Impactful (5%)**: A minimal portion find it slightly impactful, while **Neutral (12%)** indicates some uncertainty about the severity of the issue.
  - **Not Impactful (0%)**: None of the respondents in URR consider soil erosion to be not impactful, underscoring its perceived importance.

**Conclusion:**

- **Widespread Concern**: Overall, 45% of respondents across all regions consider soil erosion to be impactful, while 19% view it as very impactful. This shows that soil erosion is widely regarded as a constraint to agroecology, with varying levels of severity.

- **Regional Variations**:
    - **CRR South** has the highest percentage of respondents who consider soil erosion impactful (67%), making it the region where soil erosion is seen as most problematic.
    - **NBR** is the region with the largest percentage of respondents who see soil erosion as slightly impactful (55%), suggesting that while it is recognized as a challenge, it may not be seen as particularly severe.
    - **URR** and **CRR North** also report significant concern about soil erosion, with 63% and 32% of respondents, respectively, viewing it as impactful and over 20% in each region considering it very impactful.
- **Manageable in Some Regions**: In regions like **NBR**, a substantial percentage of respondents (13%) view soil erosion as not impactful, indicating that it may be a more manageable challenge in these areas.
- **Diverse Impacts**: The overall data suggests that soil erosion is a recognized constraint across all regions, but the degree of its impact varies, with some regions facing more severe challenges than others.

## Figure 53: Soil erosion as a constraint to agroecology



## 4.14: Adequate markets for the sale of agroecological products

The availability, access and number of adequate markets are key influential factors and determinants for sales of agroecological products in the communities. The overall perception and knowledge of the respondents on the availability of adequate markets for the sale of agroecological product is shown in Figure 54. Most of the respondents (51%) said that the markets for sale of agroecological products are inadequate followed by those who mention highly inadequate (32%) in the different communities. However, some of the respondents (12%) indicated that the markets for sale of agroecological product are adequate and highly adequate (2%) in the communities.

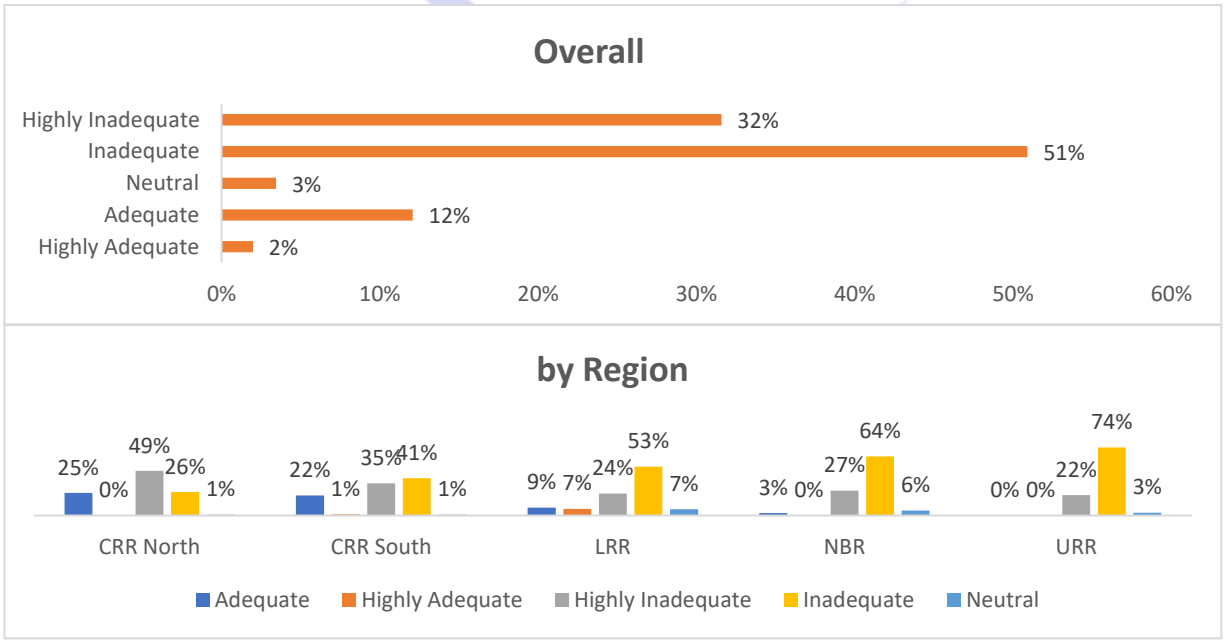
Regional Comparative Analysis on adequate markets for the sale of agroecological products

In addition, a comparative analysis was carried out to determine the perception of the respondents in the study area on the availability of adequate markets for the sale of agroecological products in the various regions (Figure 54). The result shows that the markets for the sale of agroecological product in all the survey regions are not adequate. Majority of respondents in URR (74%), NBR (64%), LRR (53%) and CRRS (41%) stated that the markets for the sales of agroecological products are inadequate in their communities. While 49% of them in CRRN indicated that the markets for the sale of agroecological products are highly inadequate in the region. However, significant percentage of respondents in CRRN (25%) and CRRS (22%) mentioned that the markets are adequate compared to other regions. Similarly, only LRR (7%) and CRRS (1%) indicated the availability of highly adequate markets for the sale of agroeclogical products in their communities.

The results obtained from the study implies that the markets for the sale of agroecological products are inadequate in most of the regions. This could have negative implaction on the level of practice of agroecology in the region since availability and access to the markets are low for the farmers.



**Figure 54: Adequate markets for the sale of agroecological products**



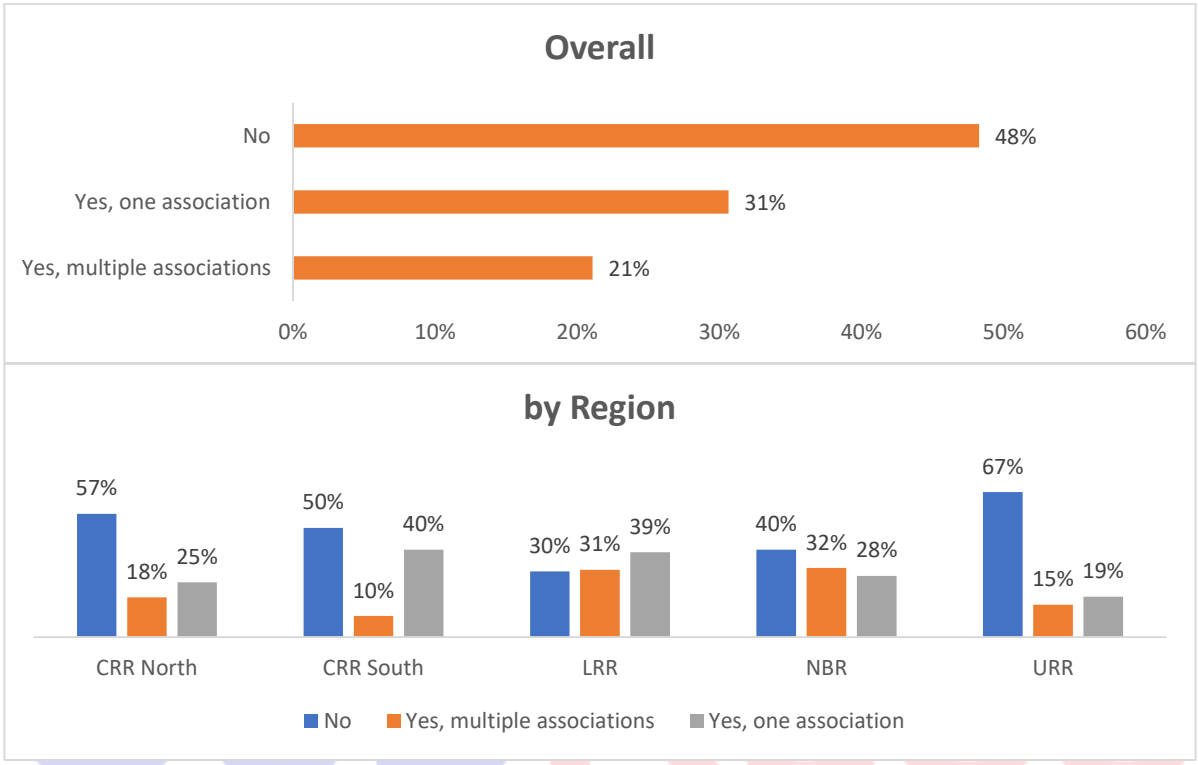
## 4.15: Women horticultural production and marketing associations in agroecology

Figure 55 shows the overall participation of the women horticultural production and marketing associations in agroecological practices. Majority of the respondents (48%) indicated that there are no existence/participation of women horticultural production and marketing associations in agroecological practices in their communities. However, 31% and 21 % of the respondents stated the participation of one and multiple associations, respectively of women horticultural production and marketing in agroecology in their communities.

**Regional Comparative Analysis on women horticultural production and marketing associations in agroecology**

For the regional comparative analysis, most of the respondents in URR (67%) CRRN (57%), CRRS (50%) and NBR (40%) indicated that there are no participation of the women horticultural production and marketing associations in agroecological practices (Figure 22). However, in LRR most of the respondents (39 %) stated that they have one association of women horticultural production and marketing participating in agroecological practices. All the regions reported having one association of women horticultural production and marketing participation in agroecological practices. The highest percentage of respondents having one association was observed in CRRS (40%) followed by LRR (39%), NBR (28%) and CRRN (25%). The lowest percentage of respondents having one association was obtained from URR (19%). Similarly, the existence of multiple associations of women horticultural production and marketing participating in agroecological practices were reported in all the regions. The highest percentage of respondents who reported multiple associations was recorded in NBR (32%) followed by LRR (31%), CRRN (18%), URR (15%) and CRRS (10%).

**Figure 55: Women horticultural production and marketing associations in agroecology**




# F. Opportunities for Implementation Of Agroecology

## 5.0 Opportunities for Implementation of Agroecology

## 5.1 Adequacy of Land and Water Resources for Implementation of Agroecology

Figure 4.1 below reports diagnostic assessment of the adequacy of land and water resources for the implementation of agroecology across five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about the adequacy of land and water resources for the implementation of agroecology in the five regions of The Gambia and the cumulative results revealed that 38% of respondents reported that land and water resources are inadequate for the implementation of agroecology in their communities, 8% said they are "highly inadequate", 29% said they are adequate, while 12% "highly adequate". However, 12% claimed they were "neutral" about the adequacy of land and water resources in their communities. This suggests that some farmers may not have strong opinions on the conditions of land and water resources conditions, possibly due to diverse levels of impact or awareness. The implication of these findings is that considerable number of farmers (47%) indicated the inadequacy of land and water resources for the implementation of agroecology across the five (5) rural farming regions of The Gambia which authorities should address to increase opportunities for agroecological farming.

Agroecological practices have the potential to significantly contribute to long-term environmental and economic sustainability in The Gambia. By prioritizing organic farming methods, such as

composting and natural pest control, agroecology reduces the reliance on chemical inputs like synthetic fertilizers and pesticides. This not only improves soil health and biodiversity but also minimizes pollution of water sources and degradation of ecosystems. Moreover, agroecology promotes crop diversification, which can enhance food security and resilience to climate change, as farmers can adapt to shifting weather patterns by planting a variety of crops suited to different conditions. Economically, the adoption of agroecological practices can help lower farming costs for smallholders by reducing the need for expensive chemical inputs, while creating local markets for organic produce and fertilizers. Over time, these practices can empower rural communities, especially youth and women, by providing them with sustainable livelihoods and ensuring that future generations benefit from a healthier environment and a more stable agricultural sector.

## 5.2: Regional Comparative Analysis on the Adequacy of Land and Water Resources

Figure 56 below reports diagnostic study results on the adequacy of land and water resources for the implementation of agroecology in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR.

For **CRR-North**, the survey findings show that 33% of respondents reported that land and water resources are inadequate for the implementation of agroecology in their communities, 26% said "highly inadequate", 25% "adequate", while 1% "highly adequate". However, 15% claimed they were "neutral" about the adequacy of land and water resources in their communities.

Concerning **CRR-South**, the analysis reveals that 44% of respondents reported that land and water resources are inadequate for the implementation of agroecology in their communities, 31% said "highly adequate", while 14% "adequate". However, 11% claimed they were "neutral" about the adequacy of land and water resources in their communities.



Regarding **LRR**, the findings show that 35% of respondents reported that land and water resources are adequate for the implementation of agroecology in their communities, 25% said "highly adequate", while 33% "inadequate". However, 7% claimed they were "neutral" about the adequacy of land and water resources in their communities.

For **NBR**, the survey indicates that 57% of respondents reported that land and water resources are inadequate for the implementation of agroecology in their communities, 6% said "highly inadequate", 25% "adequate", while 1% "highly adequate". However, 10% claimed they were "neutral" about the adequacy of land and water resources in their communities.

For **URR**, the diagnostic results reveal that 44% of respondents reported that land and water resources are adequate for the implementation of agroecology in their communities, 1% said "highly adequate", 32% "inadequate", while 6% "highly inadequate". However, 17% claimed they were "neutral" about the adequacy of land and water resources in their communities.

## Figure 56: Adequacy of Land and Water Resources for The Implementation of Agroecology

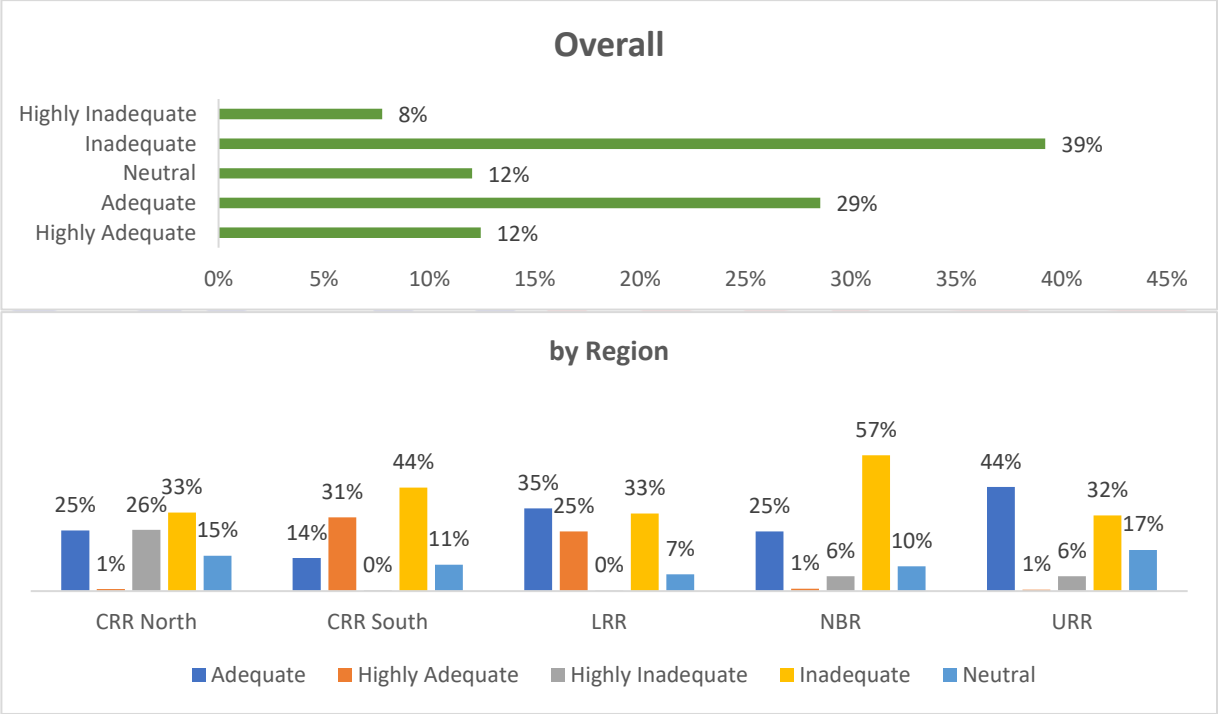



Figure 56 below reports diagnostic assessment of the national policy towards the implementation of agroecology across five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how supportive is the national policy towards the implementation of agroecology in the five regions of The Gambia and the cumulative results revealed that 23% of respondents reported that National Policy is "unsupportive" towards the implementation of agroecology in their communities, 11% said the Policy is "very unsupportive", 21% said it is supportive, while 3% "very supportive". However, 26% and 17% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively. This suggests that some farmers may not have critical views on the National Policy support towards the implementation of agroecology in their communities, probably due to diverse levels of impact or awareness. The implication of these findings is that considerable number of farmers (34%) indicated the inadequacy of National Policy support towards for the implementation of agroecology across the five (5) rural farming regions of

The Gambia which authorities should address to increase opportunities for agro-ecological farming.

## 5.3: Regional Comparative Analysis on National Policy Support for the Implementation of Agro-ecology

Figure 57 below reports diagnostic assessment of the National Policy towards the implementation of agroecology in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how supportive is the National Policy towards the implementation of agroecology in the relevant regions of The Gambia.

For **CRR-North**, the survey findings show that 21% of respondents reported that National Policy is "supportive" towards the implementation of agroecology in their communities, 3% said the Policy is "very supportive", 14% said it is unsupportive, while 14% "very unsupportive". However, 40% and 8% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively.

Concerning **CRR-South**, the analysis reveals that 42% of respondents reported that National Policy is "supportive" towards the implementation of agroecology in their communities, 8% said the Policy is "very supportive", 28% said it is unsupportive, while 5% "very unsupportive". However, 12% and 5% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively.

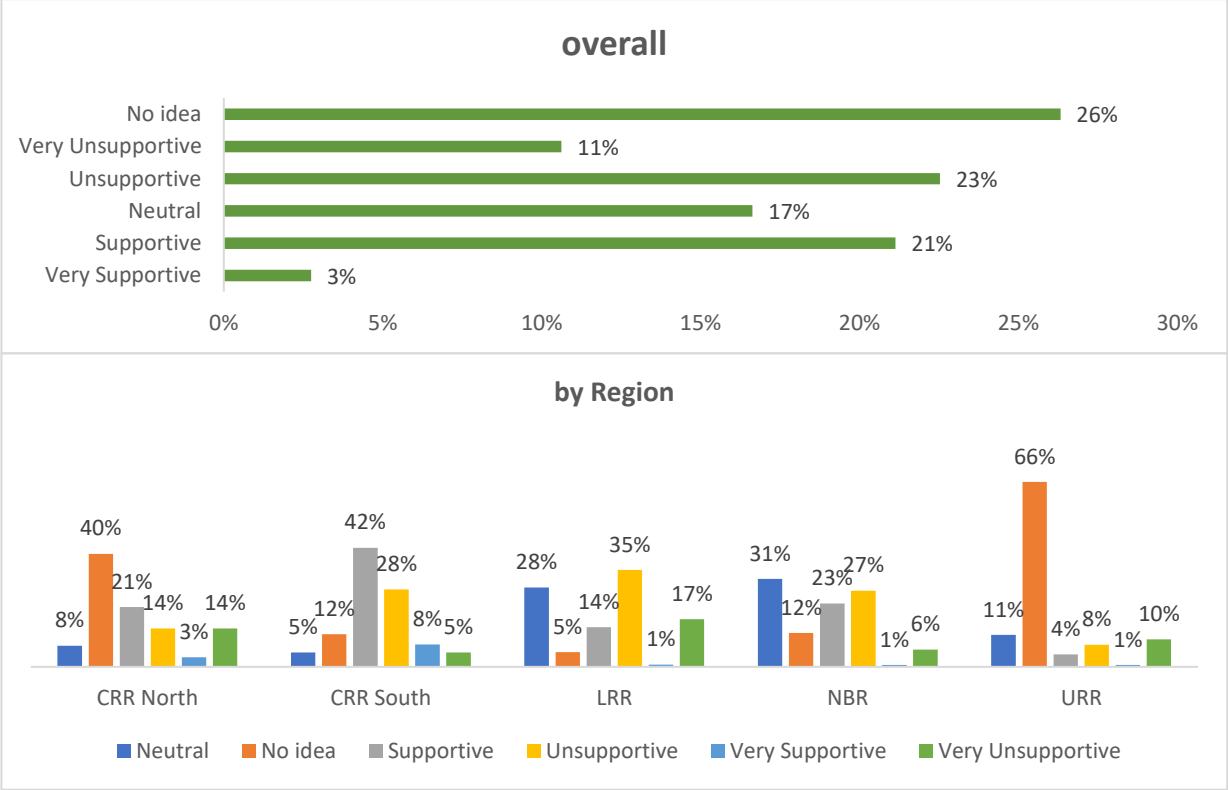
Regarding **LRR**, the findings show that 35% of respondents reported that National Policy is "usupportive" towards the implementation of agroecology in their communities, 17% said the Policy is "very unsupportive", while 14% said it is supportive, and 1% "very unsupportive". However, 5% and 28% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively.

For **NBR**, the survey indicates that 27% of respondents reported that National Policy is "unsupportive" towards the implementation of agroecology in their communities, 6% said the Policy is "very unsupportive", while 23% said it is supportive, and 1% "very supportive". However, 12% and 31% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively.

For **URR**, the diagnostic results reveal that 10% of respondents reported that National Policy is "very unsupportive" towards the implementation of agroecology in their communities, 8% said the Policy is "unsupportive", while 4% said it is supportive, and 1% "very supportive". However, 66% and 11% claimed they "have no idea" or were "neutral" about the National Policy support towards the implementation of agroecology in their communities respectively.

The implication of these findings is that considerable number of farmers from LRR (52%), CRR-South (33%), and NBR (33%) indicated the inadequacy of National Policy support for the implementation of agroecology across the three (3) rural farming regions of The Gambia which authorities should address to increase opportunities for agro-ecological farming in these areas.

**Figure 57: National Policy Support for the Implementation of Agro-ecology**




## 5.4 Donor Agencies' Support for the Implementation of Agro-ecology

Figure 58 below reports the overall diagnostic assessment of donor agencies' support for the implementation of agroecology across five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked what extent do donor agencies support the implementation of agroecology in your community. The cumulative results revealed that 47% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "low", 32% said donor support is "very low", while 9% said it is "high". However, 12% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities. This suggests that some farmers may not have critical views on donor agencies' support for the implementation of agroecology in their communities, probably due

to diverse levels of impact or awareness. The implication of these findings is that overwhelming number of farmers (79%) indicated "low" donor agencies' support for the implementation of agroecology across the five (5) rural farming regions of The Gambia which authorities should engage donors to intervene in this area with a view to increasing opportunities for agro-ecological farming.

Figure 58 below reports the regional diagnostic assessment of donor agencies' support for the implementation of agroecology in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked what extent do donor agencies support the implementation of agroecology in your community.

For **CRR-North**, the survey findings show that 171% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "very low", 129% said donor support is "low", while 20% said it is "high", and 2% "very high". However, 35% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities.

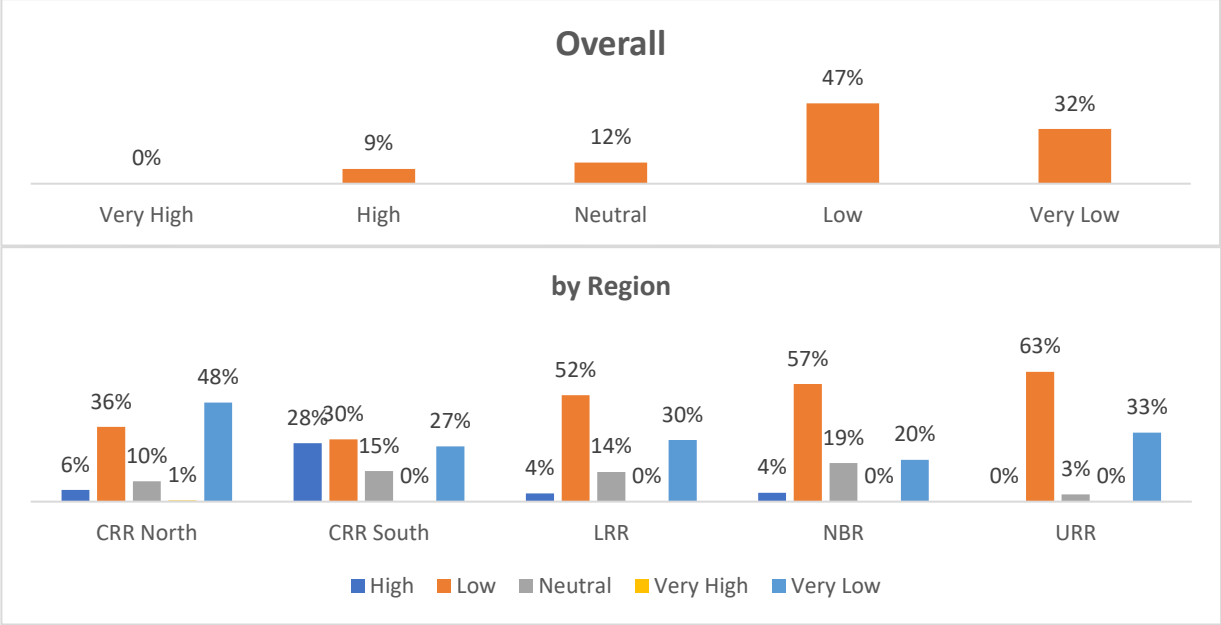
For **CRR-South**, the analysis reveals that 106% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "low", 94% said donor support is "very low", while 99% said it is "high". However, 52% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities.

For **LRR**, the survey results show that 197% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "low", 114% said donor support is "very low", while 15% said it is "high", and 1% "very high". However, 55% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities.

For **NBR**, the findings show that 174% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "low", 62% said donor support is "very low", while 13% said it is "high". However, 57% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities.

For **URR**, the analysis indicates that 199% of respondents reported that donor agencies' support for the implementation of agroecology in their communities is "low", 106% said donor support is "very low", while 1% said it is "high". However, 11% claimed they were "neutral" about donor agencies' support for the implementation of agroecology in their communities.

**Figure 58: Donor Agencies' Support for the Implementation of Agro-ecology**




## 5.5: Effectiveness of Established Women Associations in Supporting the Implementation of Agroecology

Figure 59 below reports the overall diagnostic assessment of the effectiveness of established women associations in supporting the implementation of agroecology across five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked how effective are established women associations in supporting the implementation of agroecology. The cumulative results revealed that 42% of respondents reported that established women associations are "effective" in supporting the implementation of agroecology in their communities, 5% said they are "very effective", while 29% said they are "ineffective" and 11% "very ineffective".

However, 13% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

**Regional Comparative Analysis on the Effectiveness of Established Women Associations in Supporting the Implementation of Agroecology**

Figure 59 below reports regional diagnostic assessment of the effectiveness of established women associations in supporting the implementation of agroecology in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how effective are established women associations in supporting the implementation of agroecology.

For **CRR-North**, the individual regional survey results show that 34% of respondents reported that the established women associations are "ineffective" in supporting the implementation of agroecology in their communities, 32% said they are "very ineffective", while 26 said they are "effective" and 4% "very effective". However, 3% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

For **CRR-South**, the individual regional analysis reveals that 38% of respondents reported that the established women associations are "ineffective" in supporting the implementation of agroecology in their communities, 11% said they are "very ineffective", while 35% said they are "effective" and 5% "very effective". However, 11% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

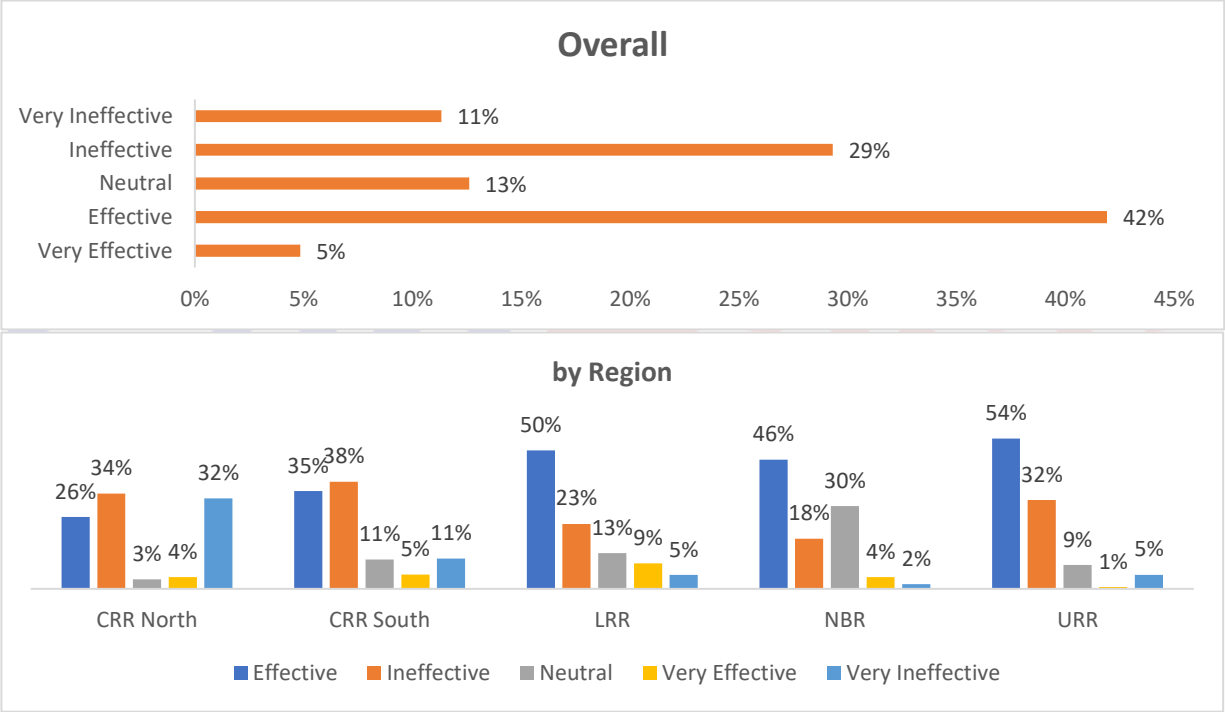
For **LRR**, the survey results show that 50% of respondents reported that the established women associations are "effective" in supporting the implementation of agroecology in their communities, 9% said they are "very effective", while 23% said they are "ineffective" and 5% "very ineffective". However, 13% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

For **NBR**, the findings show that 46% of respondents reported that the established women associations are "effective" in supporting the implementation of agroecology in their communities, 4% said they are "very effective", while 18% said they are "ineffective" and 2% "very ineffective". However, 30% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

For **URR**, the analysis indicate that 50% of respondents reported that the established women associations are "effective" in supporting the implementation of agroecology in their communities, 1% said they are "very effective", while 32% said they are "ineffective" and 5% "very ineffective". However, 9% claimed they were "neutral" about the effectiveness of established women associations in supporting the implementation of agroecology in their communities.

The implication of these findings is that considerable number of farmers from LRR (59%), URR (55%), and NBR (50%) indicated the effectiveness of established women associations in supporting the implementation of agroecology among the five (5) rural farming regions of The Gambia. This is followed by CRR-South (40%) and CRR-North (30) indicating a considerable degree of effectiveness of established women associations. This signifies that the authorities should empower established women associations to enable them fully support the implementation of agroecology in these regions.

**Figure 59: Effectiveness of Established Women Associations in Supporting the Implementation of Agroecology**




# G. Climate Change on Agroecology And Organic Fertilizer

## 6.1: Climate Change Challenges on Agroecological Practices

This analysis focuses on the various climate-related challenges faced by agroecological practices across the regions of CRR North, CRR South, LRR, NBR, and URR. The data highlights how different factors such as drought, flooding, pests, and soil fertility are perceived as impacting agroecology in these regions.

**Overall Analysis**

- **Reduced Soil Fertility (52%)**: Over half of the respondents believe that climate-related factors, particularly reduced soil fertility, have a significant impact on agroecology. This is in line with the Ministry of Agriculture's findings that The Gambia's Agro-Ecological Zones (AEZs) suffer from land degradation due to deforestation, desertification, and biodiversity loss.

- **Pests and Diseases (48%)**: Nearly half of the respondents report that pests and diseases, exacerbated by climate change, affect agroecology, highlighting an important challenge that requires mitigation strategies.
- **Flooding (39%)**: About 39% of respondents associate flooding with climate change impacts on agroecology. While less prominent than drought and soil fertility, flooding is still considered a substantial challenge, particularly in low-lying areas.
- **Drought (72%)**: The most widely reported challenge, with 72% of respondents citing drought as a major constraint to agroecology, underscoring the vulnerability of agricultural practices to climate-induced water shortages.
- **Increased Temperature (72%)**: Alongside drought, increased temperature is seen as a critical issue, with 72% of respondents believing it significantly affects agroecological practices.
- **Other Factors (1%)**: Only a small portion of respondents (1%) attribute challenges in agroecology to factors outside of climate change, suggesting that climate factors are overwhelmingly seen as the primary constraints.

**Regional Analysis of Climate Change Challenges on Agroecology**

1. **CRR North**:
    - **Drought (30%)**: A substantial portion of respondents view drought as a key challenge in agroecology, consistent with the region's exposure to dry conditions.
    - **Flooding (22%)**: Flooding is also a concern, though less prominent than drought, affecting agroecological activities in specific areas.
    - **Increased Temperature (24%)**: Climate-induced temperature rises are viewed as a challenge by nearly one-quarter of respondents.
    - **Pests and Diseases (11%)**: Only 11% of respondents report pests and diseases as a climate-related challenge, indicating this issue is less of a concern in CRR North compared to other regions.
    - **Reduced Soil Fertility (13%)**: A moderate number of respondents highlight soil fertility decline as a significant challenge.
2. **CRR South**:
    - **Drought (27%)**: Drought is perceived as the most pressing climate challenge in CRR South, though less severe than in some other regions.
    - **Flooding (16%)**: Respondents in CRR South are less concerned about flooding compared to CRR North.
    - **Increased Temperature (25%)**: Similar to CRR North, increased temperatures are seen as a considerable constraint to agroecology.
    - **Pests and Diseases (11%)**: Like CRR North, pests and diseases are of limited concern in this region.
    - **Reduced Soil Fertility (21%)**: Over one-fifth of respondents see soil fertility loss as a significant challenge, suggesting a broader issue across multiple regions.
3. **LRR**:
    - **Drought (25%)**: LRR respondents also highlight drought as a key challenge, though slightly less pronounced than in CRR.
    - **Flooding (8%)**: Flooding is seen as a minor concern, indicating the region's relative resilience to heavy rainfall.
    - **Increased Temperature (30%)**: Temperature increases are reported as a serious concern, with nearly one-third of respondents impacted.

- **Pests and Diseases (24%)**: LRR has a higher percentage of respondents reporting pests and diseases as a significant challenge compared to other regions.
- **Reduced Soil Fertility (12%)**: Soil fertility issues are less prominent in LRR than in CRR but still represent a concern.

4. **NBR**:
   - **Drought (11%)**: NBR respondents are less concerned about drought compared to other regions, with only 11% reporting it as a challenge.
   - **Flooding (10%)**: Flooding is not seen as a major issue in NBR, with low percentages of respondents identifying it as a challenge.
   - **Increased Temperature (23%)**: Increased temperatures pose a moderate challenge, with just under a quarter of respondents reporting it as impactful.
   - **Pests and Diseases (29%)**: Pests and diseases are a more prominent concern in NBR compared to other regions.
   - **Reduced Soil Fertility (26%)**: Over a quarter of respondents in NBR view reduced soil fertility as a significant climate-related challenge.
5. **URR**:
   - **Drought (31%)**: In URR, drought is a prominent challenge, with nearly one-third of respondents identifying it as a key issue.
   - **Flooding (15%)**: Flooding is a concern for some respondents, though less pressing than drought.
   - **Increased Temperature (23%)**: Increased temperatures are considered a significant challenge by nearly one-quarter of respondents.
   - **Pests and Diseases (9%)**: Pests and diseases are less of a concern in URR compared to other regions.
   - **Reduced Soil Fertility (21%)**: Similar to CRR South, about one-fifth of respondents in URR highlight reduced soil fertility as a key challenge.

**Conclusion:**

- **Drought and Increased Temperatures**: Drought and increased temperatures are the two most widely reported climate-related challenges to agroecology across all regions, with 72% of respondents highlighting these issues.
- **Regional Variations**: While the severity of these challenges varies by region, CRR North and URR stand out for their high levels of concern about drought and temperature increases. NBR has more concern over pests and diseases, while LRR experiences a combination of issues, including temperature increases and pests.
- **Flooding and Soil Fertility**: Flooding is a less prominent issue overall, but still affects certain regions such as CRR North. Reduced soil fertility is another widely recognized challenge, especially in NBR and CRR South.
- **Minor Impact of Other Factors**: Very few respondents (1%) attribute agroecological challenges to non-climate-related factors, underscoring the central role of climate change in shaping these challenges across The Gambia.

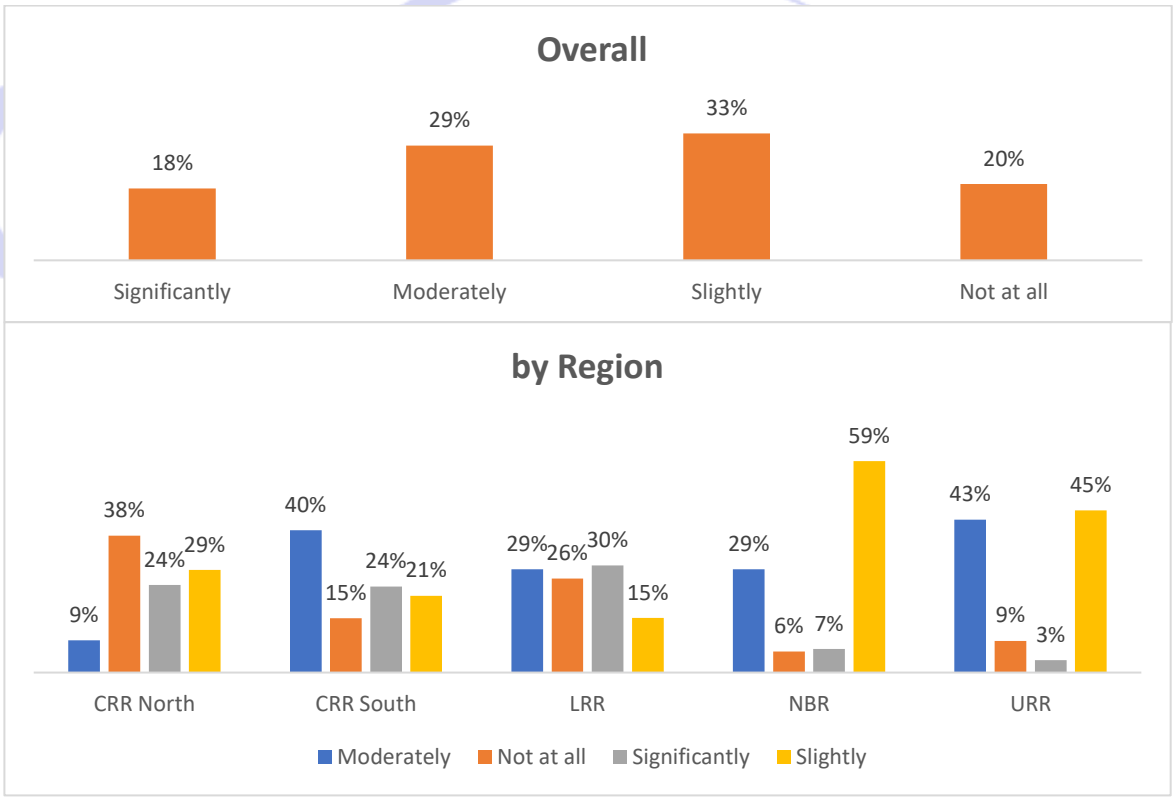
This analysis highlights the need for region-specific interventions to address the varied climate-related challenges impacting agroecology in The Gambia.

The findings of this analysis align closely with The Gambia's national climate change strategies, particularly those outlined in its National Adaptation Plan (NAP) and Nationally Determined Contributions (NDC) under the Paris Agreement. Agroecology, as highlighted by the challenges

of drought, increased temperatures, and reduced soil fertility, offers a sustainable approach to mitigating the effects of climate change. By promoting organic farming practices, agroecology can enhance soil health, increase biodiversity, and improve water retention, making agricultural systems more resilient to extreme weather events such as drought and flooding. Moreover, agroecology can reduce dependence on chemical inputs, contributing to a reduction in greenhouse gas emissions from the agricultural sector.

The findings suggest that region-specific interventions, such as improved infrastructure, climate-smart agricultural practices, and targeted training programs, could significantly enhance the ability of farming communities to adapt to and mitigate the adverse effects of climate change. As The Gambia continues to implement its climate change strategies, agroecology stands as a critical tool in achieving sustainable agriculture, improving food security, and promoting economic resilience among vulnerable populations, particularly women, youth, and persons with disabilities.

**Figure 60: Challenges caused by climate change on Agroecology**




## 6.2: Climate Change & Organic Fertilizer Production

When respondents were asked if climate-related challenges affect organic fertilizer production across CRR-North, CRR-South, LRR, NBR, and URR, the findings highlight several significant trends:

- **Reduced Soil Fertility (37%)**: A notable 37% of respondents believed that climate-related factors have contributed to reduced soil fertility, which affects organic fertilizer production. This aligns with the Ministry of Agriculture's assessment of widespread land degradation in the Gambia's Agro-Ecological Zones (AEZs), where deforestation, desertification, and biodiversity loss are pressing issues.
- **Pests and Diseases (24%)**: Approximately 24% of respondents cited pests and diseases as challenges linked to climate change, adversely impacting the production process.
- **Flooding (35%)**: Flooding was identified as a significant climate-related challenge, with 35% of respondents noting its adverse effects on organic fertilizer production.
- **Drought (38%)**: Drought was recognized by 38% of respondents as a major challenge. This reflects the increasing vulnerability of regions like the North Bank Region to drought due to low rainfall, as highlighted by Yaffa (2013), where droughts and soil erosion have worsened over time.
- **Increased Temperature (51%)**: Over half of the respondents (51%) identified increased temperatures as a considerable challenge, pointing to the strain that rising temperatures place on organic fertilizer production processes.
- **Other Factors (15%)**: Only 15% of respondents attributed challenges in organic fertilizer production to non-climate-related factors, suggesting that climate change is overwhelmingly viewed as the primary driver of difficulties in this domain.

**Regional Analysis of Challenges Caused by Climate Change**

**CRR-North**

- **Drought (39%)**: In this region, nearly four in ten respondents considered drought a major climate-related challenge for organic fertilizer production.
- **Flooding (18%)**: Around 18% of respondents linked flooding to difficulties in organic fertilizer production.
- **Increased Temperature (22%)**: Increased temperatures were reported by 22% as a key challenge.
- **Other Factors (1%)**: Only 1% of respondents saw other factors as impactful.
- **Pests and Diseases (8%)**: Pests and diseases were a challenge for 8% of respondents.
- **Reduced Soil Fertility (11%)**: Reduced soil fertility was considered a challenge by 11% of respondents.

**CRR-South**

- **Drought (20%)**: One-fifth of respondents in CRR-South reported that drought posed a significant challenge.
- **Flooding (22%)**: Similar to CRR-North, 22% highlighted flooding as a problem.
- **Increased Temperature (19%)**: Increased temperatures were seen as a challenge by 19% of respondents.

- **Other Factors (7%)**: About 7% of respondents cited other, non-climate-related challenges.
- **Pests and Diseases (11%)**: Pests and diseases were considered a challenge by 11% of respondents.
- **Reduced Soil Fertility (22%)**: An equal percentage (22%) linked reduced soil fertility to challenges in fertilizer production.

**LRR**

- **Drought (8%)**: Only 8% of respondents in LRR identified drought as a challenge.
- **Flooding (8%)**: Similarly, 8% noted flooding as a significant issue.
- **Increased Temperature (35%)**: A striking 35% of respondents saw increased temperatures as a major obstacle, the highest percentage across all regions for this factor.
- **Other Factors (20%)**: LRR had the highest percentage of respondents (20%) attributing challenges to other factors outside of climate change.
- **Pests and Diseases (22%)**: Around 22% of respondents cited pests and diseases as a challenge.
- **Reduced Soil Fertility (8%)**: Reduced soil fertility was highlighted by 8% of respondents as a problem.

**NBR**

- **Drought (2%)**: In NBR, only 2% of respondents believed drought was a major challenge for organic fertilizer production.
- **Flooding (15%)**: About 15% noted flooding as a concern.
- **Increased Temperature (32%)**: A significant proportion (32%) identified increased temperatures as a challenge.
- **Other Factors (8%)**: Similar to LRR, 8% of respondents in NBR saw other factors as contributing to difficulties.
- **Pests and Diseases (10%)**: Pests and diseases were reported as challenges by 10% of respondents.
- **Reduced Soil Fertility (31%)**: In NBR, 31% of respondents indicated that reduced soil fertility was a major issue.

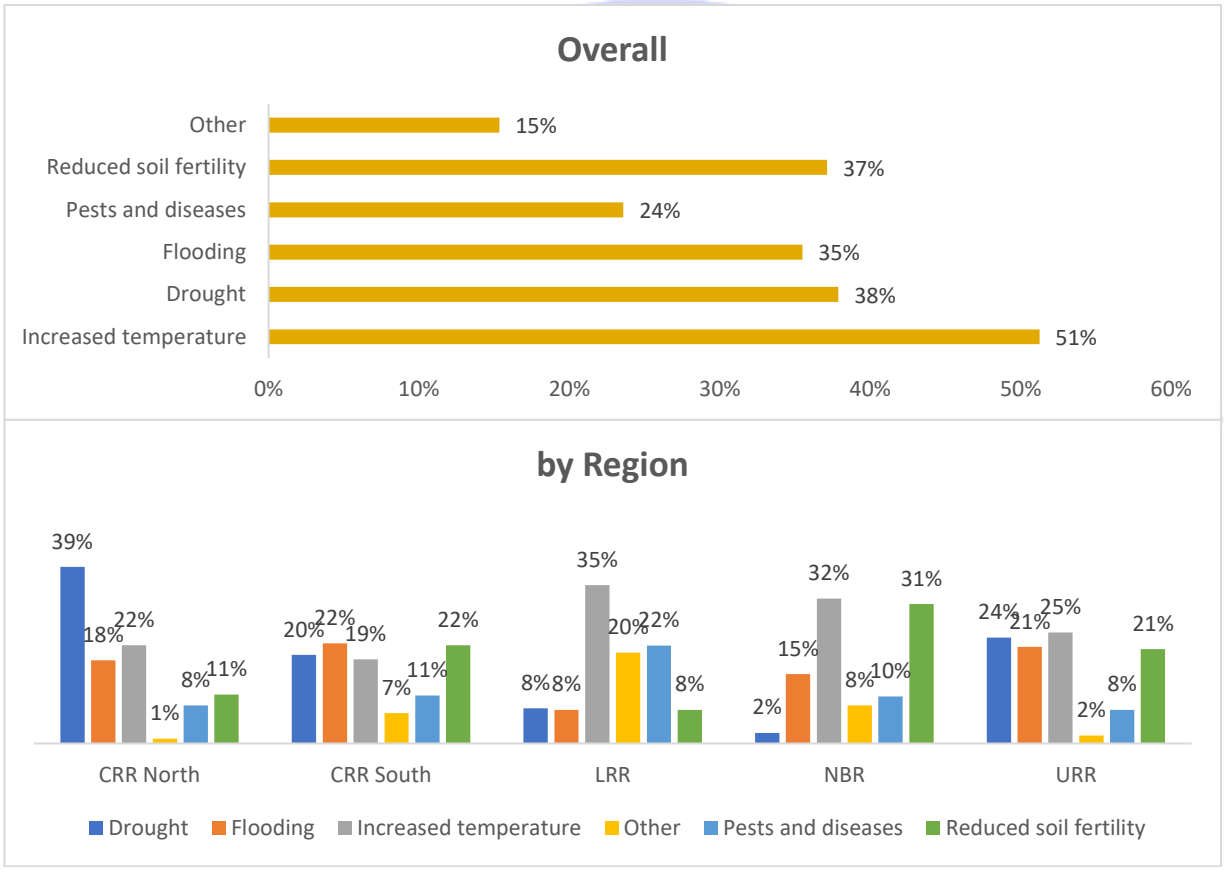
**URR**

- **Drought (24%)**: In URR, 24% of respondents highlighted drought as a key challenge.
- **Flooding (21%)**: A considerable 21% noted flooding as a significant challenge.
- **Increased Temperature (25%)**: Increased temperature was identified as a major obstacle by 25% of respondents.

- **Other Factors (2%)**: Only 2% believed other factors were responsible for the challenges in organic fertilizer production.
- **Pests and Diseases (8%)**: Pests and diseases were a concern for 8% of respondents.
- **Reduced Soil Fertility (21%)**: Finally, 21% of respondents in URR identified reduced soil fertility as a significant issue in organic fertilizer production.

This regional breakdown reveals varying degrees of vulnerability to climate-related challenges across different regions, with increased temperature and drought being consistently reported as major obstacles in organic fertilizer production.

## Figure 61: Climate-related challenges



# H. Economic Impact

## 7.1: Community Support and Social Dynamics Impact Your Agroecological Practices

**Overall Analysis**

The figure presents how community support and social dynamics impact agroecological practices across different regions. Key findings show the following overall distribution:

- **High** community support: 29%
- **Low** community support: 25%
- **Neutral**: 20%
- **Very High**: 7%
- **Very Low**: 18%

This suggests that the majority of respondents have either high or low levels of community support (54% combined), with relatively fewer reporting extreme positions such as "Very High" (7%) or "Very Low" (18%).

**Regional Analysis**

1. **CRR North**:
    - **Very Low**: 48% of respondents in CRR North report very low community support, the highest across all regions. This indicates significant challenges in garnering community backing for agroecological practices in this region.
    - **Low**: 32% also report low community support, reinforcing the idea that CRR North faces substantial social resistance or lack of collective effort in these practices.
    - Only 5% report high support, and 7% report very high support, which highlights how community dynamics are a significant barrier here.
2. **CRR South**:
    - **High**: 46% of respondents in CRR South report high community support, one of the most favorable regions in terms of social support for agroecological practices.
    - **Very High**: 19% also report very high support, suggesting that CRR South has a strong community alignment with agroecological goals.
    - Only 2% report very low support, indicating that most respondents in this region feel positively supported in their agroecological practices.
3. **LRR**:
    - **High**: 36% report high support, and **Low**: 35% report low support. This region is quite balanced between positive and negative perceptions of community support.

- Only a small percentage (5%) report very low community support, while 6% feel they have very high support.

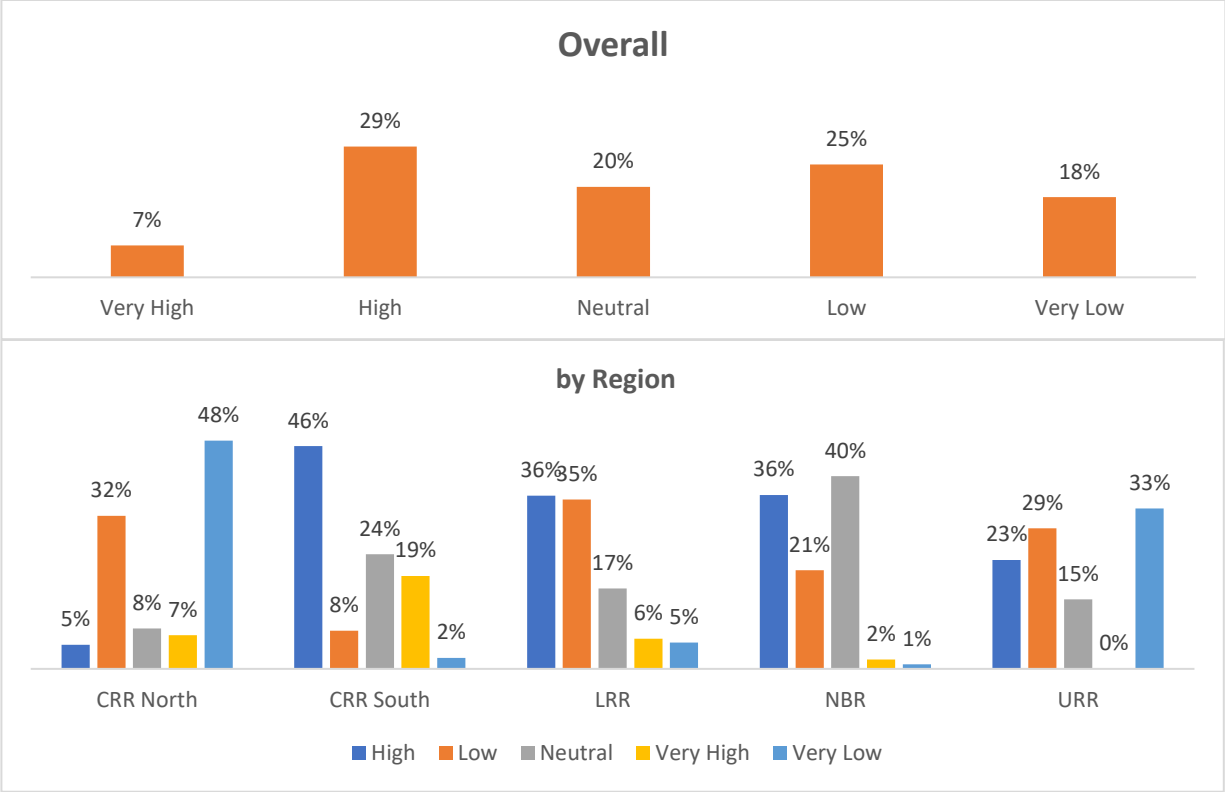
4. **NBR**:
    - **Neutral**: 40% of respondents feel neutral about the level of community support for agroecological practices in NBR, which is the highest "neutral" score across all regions. This suggests that opinions on community support may be more ambivalent or inconsistent.
    - **High**: 36% report high community support, showing that while many may be indifferent, there is still a strong portion that feels positive about community backing.
    - Only 1% report very low support, indicating minimal resistance in this region.
5. **URR**:
    - **Very Low**: 33% report very low community support, making it the second-highest region with negative sentiments about social backing.
    - **High**: 23% report high support, while no respondents feel they have very high support, which points to a divided community when it comes to agroecological practices.

**Conclusion**

- **CRR North** and **URR** face significant challenges with low or very low community support for agroecological practices, which suggests the need for targeted interventions to foster community engagement and cooperation.
- **CRR South** emerges as the region with the most favorable community support, showing strong alignment and encouragement for agroecological practices.
- **LRR** shows a mixed perspective, with almost equal portions reporting both high and low support.
- **NBR** has the highest neutral perception of community support, meaning the community may not be actively involved or particularly opposed to agroecological practices, leaving room for more engagement.

Addressing these social dynamics and enhancing community support will be crucial for promoting agroecological practices across all regions.

## Figure 63: Community Support and Social Dynamics Impact




## 7.2: Main social barriers prevent wider adoption of agroecology

**Overall Trends**

When examining the social barriers preventing the wider adoption of agroecology, the most significant barriers across all regions are:

- **Lack of Awareness (39%)**: This is the most prevalent barrier, indicating that a significant proportion of communities lack the necessary information about agroecology, which limits its adoption. Awareness campaigns and educational initiatives are essential to address this.
- **Cultural Beliefs (34%)**: Cultural norms and traditions also pose substantial challenges. Many communities may be attached to long-standing agricultural practices, making it difficult to shift toward agroecological methods.
- **Resistance to Change (14%)**: Resistance to adopting new practices, which could be due to a lack of understanding or fear of failure, also plays a notable role.
- **Lack of Community Support (13%)**: Social cohesion and community-level collaboration are key in promoting agroecology. However, some communities experience low support, which hinders collective action.
- **Other Barriers (0%)**: Interestingly, no respondents identified other barriers outside these categories, suggesting that the primary barriers are well-defined within these themes.

**Regional Analysis**

A closer look at each region shows variation in the barriers faced, suggesting that interventions may need to be tailored to each region's unique social landscape:

1. **CRR North**:
    - **Cultural Beliefs (44%)**: This region has the highest percentage of respondents indicating that cultural beliefs are a significant barrier. Traditional practices may be deeply rooted, making it difficult to introduce agroecology.
    - **Lack of Awareness (28%)**: While a substantial portion of respondents highlight a lack of awareness, it is less severe here compared to the overall figure.
    - **Resistance to Change (17%)**: There is a moderate level of resistance to change, which suggests that targeted efforts to demonstrate the benefits of agroecology may help overcome this barrier.
    - **Lack of Community Support (11%)**: A relatively small percentage points to the lack of community support, though this is still a consideration.
2. **CRR South**:
    - **Lack of Awareness (59%)**: The highest percentage of respondents in CRR South reported that a lack of awareness is the major barrier. This indicates that educational efforts should be focused here to increase understanding of agroecology's benefits.
    - **Resistance to Change (21%)**: Similar to the overall trend, resistance to change is also a notable barrier.
    - **Cultural Beliefs (12%)**: Cultural beliefs play a smaller role in this region compared to others.
3. **LRR**:
    - **Cultural Beliefs (65%)**: LRR has the highest percentage of respondents citing cultural beliefs as a barrier, indicating a strong adherence to traditional agricultural methods.
    - **Lack of Awareness (29%)**: Awareness is also an issue but less pressing compared to cultural resistance.
    - **Lack of Community Support (2%)**: Only 2% of respondents mentioned community support as a barrier, which suggests that collective action may not be as significant an issue here as in other regions.
4. **NBR**:
    - **Lack of Awareness (51%)**: NBR, like CRR South, faces a major barrier in terms of awareness, with over half the respondents pointing to this issue.
    - **Cultural Beliefs (31%)**: Cultural beliefs also play a significant role, though not as strongly as in LRR.

- **Lack of Community Support (16%)**: NBR has the highest percentage of respondents citing a lack of community support as a barrier, indicating a potential need for programs that foster community collaboration.

5. **URR**:
    - **Lack of Awareness (35%)**: Awareness remains an issue, though less severe compared to other regions.
    - **Cultural Beliefs (21%)** and **Resistance to Change (21%)**: Both cultural beliefs and resistance to change are equally significant barriers in URR, highlighting the need for strategies that address both social norms and hesitance to adopt new practices.
    - **Lack of Community Support (23%)**: URR has the highest reported percentage of community support issues, further emphasizing the need for community engagement initiatives.

**Conclusion**

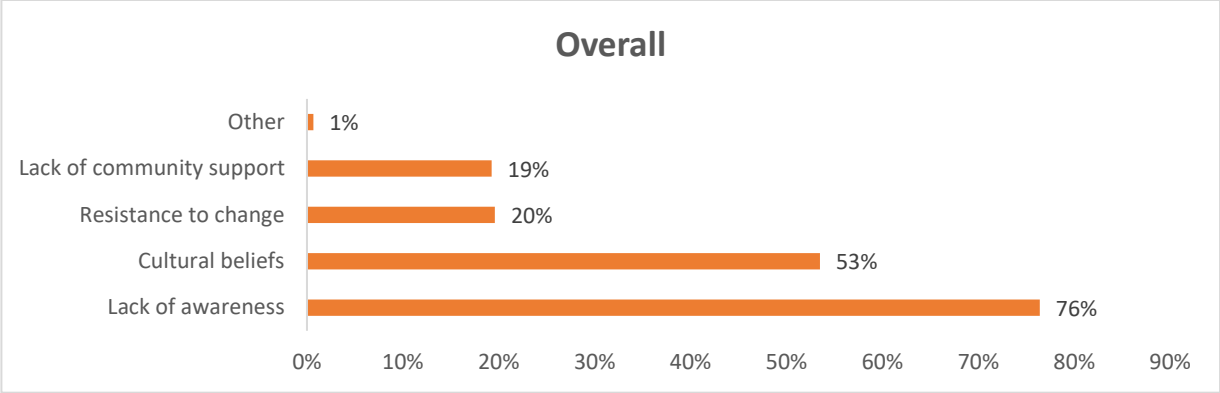
Overall, **lack of awareness** and **cultural beliefs** are the dominant barriers across regions, with **resistance to change** and **lack of community support** playing smaller but still significant roles. Each region, however, has its own unique combination of challenges:

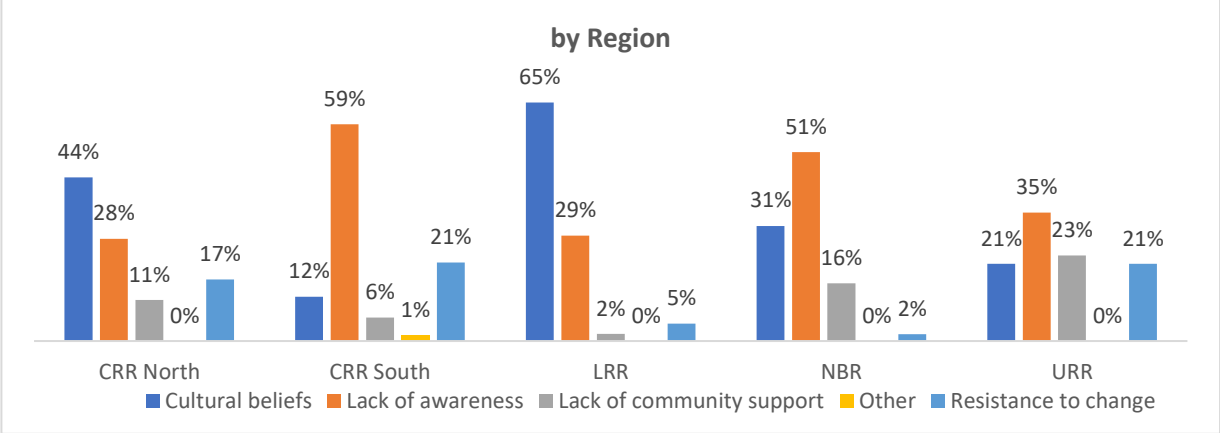
- **CRR North** and **LRR** are most affected by cultural beliefs.
- **CRR South** and **NBR** are primarily hindered by a lack of awareness.
- **URR** faces a balance of cultural beliefs, resistance to change, and community support issues.



To promote wider adoption of agroecology, interventions should be region-specific, focusing on raising awareness in CRR South and NBR, addressing cultural barriers in CRR North and LRR, and fostering community collaboration in URR.

## Figure 63: Main social barriers prevent wider adoption of agroecology




## 7.3: Social barriers that prevent wider adoption of organic fertilizers

**Overall Analysis**

Across all regions, 17% of respondents acknowledged the presence of social barriers that hinder the wider adoption of organic fertilizers, while the vast majority (83%) did not recognize these barriers. This suggests that while social barriers exist, they may not be as universally perceived or felt by all communities. Nonetheless, the 17% who do experience these barriers represent an important subset whose challenges could impact the broader adoption of organic fertilizers.

**Regional Analysis**

The perception of social barriers varies significantly between regions, indicating that region-specific dynamics influence the adoption of organic fertilizers:

1. **CRR North**:
    - **99% No, 1% Yes**: An overwhelming majority (99%) in CRR North reported no social barriers to adopting organic fertilizers. This indicates that social factors may not be a significant obstacle in this region, potentially making it more receptive to the adoption of organic fertilizers.
2. **CRR South**:
    - **74% No, 26% Yes**: In CRR South, 26% of respondents identified social barriers, making it the region with the second-highest acknowledgment of these barriers.

This suggests that social factors, such as cultural resistance or a lack of community support, are more prominent here and could hinder adoption unless addressed.

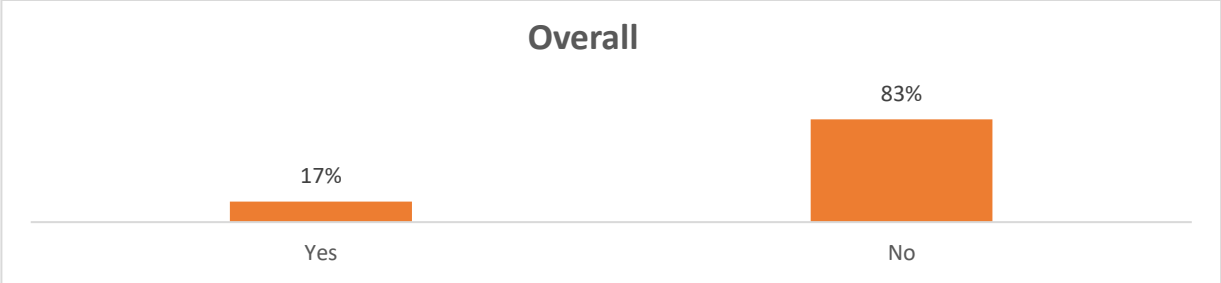
3. **LRR**:
    - **88% No, 12% Yes**: The perception of social barriers in LRR is moderate, with 12% of respondents acknowledging their presence. This indicates that while most respondents in LRR do not face significant social barriers, there is still a minority that does, which may require targeted interventions.
4. **NBR**:
    - **72% No, 28% Yes**: NBR has the highest percentage of respondents (28%) identifying social barriers to organic fertilizer adoption. This suggests that social factors are more entrenched in this region, possibly due to traditional agricultural practices or limited community awareness of the benefits of organic fertilizers.
5. **URR**:
    - **82% No, 18% Yes**: In URR, 18% of respondents reported social barriers, indicating a moderate presence of these challenges. While the majority do not see social factors as an issue, a significant portion of the population does, making it necessary to address these concerns to promote wider adoption.

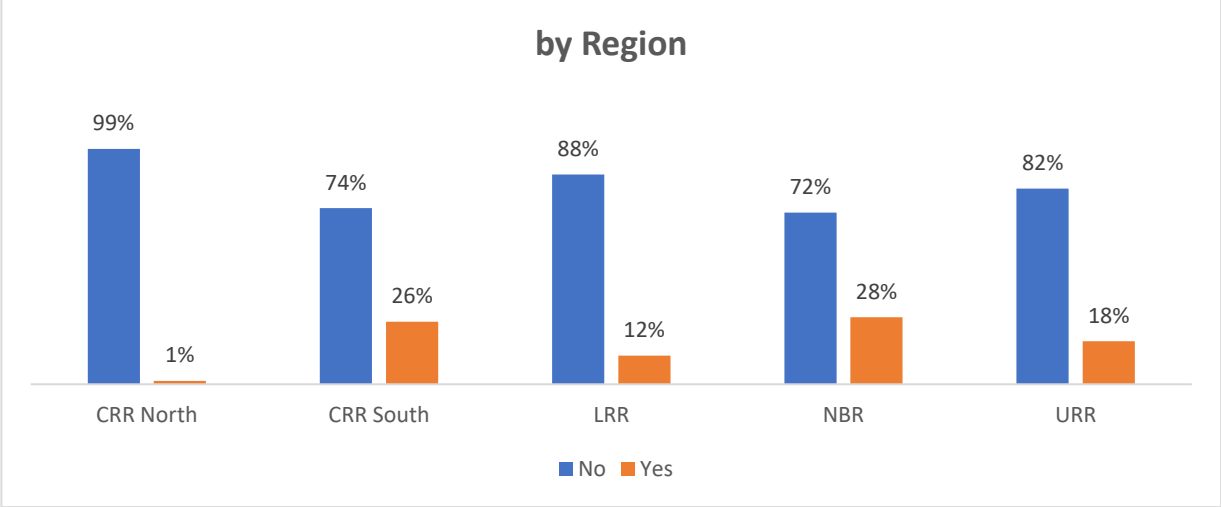
**Conclusion**

- **CRR North** and **LRR** show minimal social resistance to organic fertilizer adoption, indicating fertile ground for promoting these practices.
- **CRR South**, **NBR**, and **URR** report higher levels of social barriers, particularly **NBR** and **CRR South**, where over a quarter of respondents face social challenges.
- **NBR** (28%) appears to be the region with the greatest need for interventions to overcome social barriers, while **CRR South** (26%) follows closely behind.

Efforts to promote the wider adoption of organic fertilizers should focus on understanding and addressing the specific social challenges in **NBR** and **CRR South**, including cultural resistance, lack of community awareness, or support for organic farming practices. Meanwhile, **CRR North** and **LRR** present more favorable conditions for the adoption of organic fertilizers but should still be monitored for emerging social concerns.

## Figure 64: Social barriers that prevent wider adoption of organic fertilizers




## 7.4: Main social barriers that prevent wider adoption of organic fertilizers

**Overall Analysis**

The figure outlines five main social barriers to the adoption of organic fertilizers: cultural beliefs, lack of awareness, lack of community support, other unspecified barriers, and resistance to change. The overall percentages for each barrier are:

- **Cultural beliefs**: 31%
- **Lack of awareness**: 33%
- **Lack of community support**: 12%
- **Other**: 3%
- **Resistance to change**: 21%

The top two barriers overall are **lack of awareness** (33%) and **cultural beliefs** (31%), highlighting knowledge gaps and deeply ingrained traditions as the major hurdles to adopting organic fertilizers. **Resistance to change** also plays a significant role (21%), suggesting that introducing new methods faces substantial pushback.

**Regional Analysis**

1. **CRR North**:

- **Cultural beliefs**: 40% of respondents identified cultural beliefs as the primary barrier, the highest percentage for this category across all regions. This indicates that traditional practices and mindsets in CRR North strongly hinder the adoption of organic fertilizers.
- **Resistance to change**: 30% of respondents also noted resistance to change as a significant factor, making this region one of the most resistant to new agricultural techniques.
- **Lack of awareness**: Only 10% of respondents indicated a lack of awareness, suggesting that most people in this region know about organic fertilizers but prefer traditional methods due to cultural beliefs and resistance to change.

2. **CRR South**:
   - **Lack of awareness**: This region reports the highest percentage (51%) of respondents citing a lack of awareness as the key barrier. The low score in cultural beliefs (7%) suggests that the population is not heavily bound by tradition, but instead lacks the necessary knowledge to implement organic fertilizers.
   - **Other**: 18% reported "Other" barriers, which could point to additional factors not captured in this analysis. Further investigation into these unspecified barriers could yield valuable insights.
   - **Resistance to change** is relatively low (12%) compared to other regions, implying that once awareness is raised, the region could be more receptive to adopting organic fertilizers.
3. **LRR**:
   - **Cultural beliefs**: 46% of respondents report cultural beliefs as the main barrier, the highest percentage of any region. This suggests that deeply ingrained traditions are the most significant obstacle to organic fertilizer adoption in LRR.
   - **Lack of awareness**: 41% also cited a lack of awareness, pointing to both traditional mindsets and knowledge gaps as the key hurdles.
   - Only 4% identified a **lack of community support**, suggesting that the community is not a significant barrier in LRR.
4. **NBR**:
   - **Lack of awareness**: 55% of respondents identified lack of awareness as the primary barrier, the highest percentage across all regions. This indicates that educational campaigns could be highly effective in this region.
   - **Cultural beliefs** (30%) also play a role, but resistance to change and lack of community support are relatively minor issues (6% and 9%, respectively).
5. **URR**:

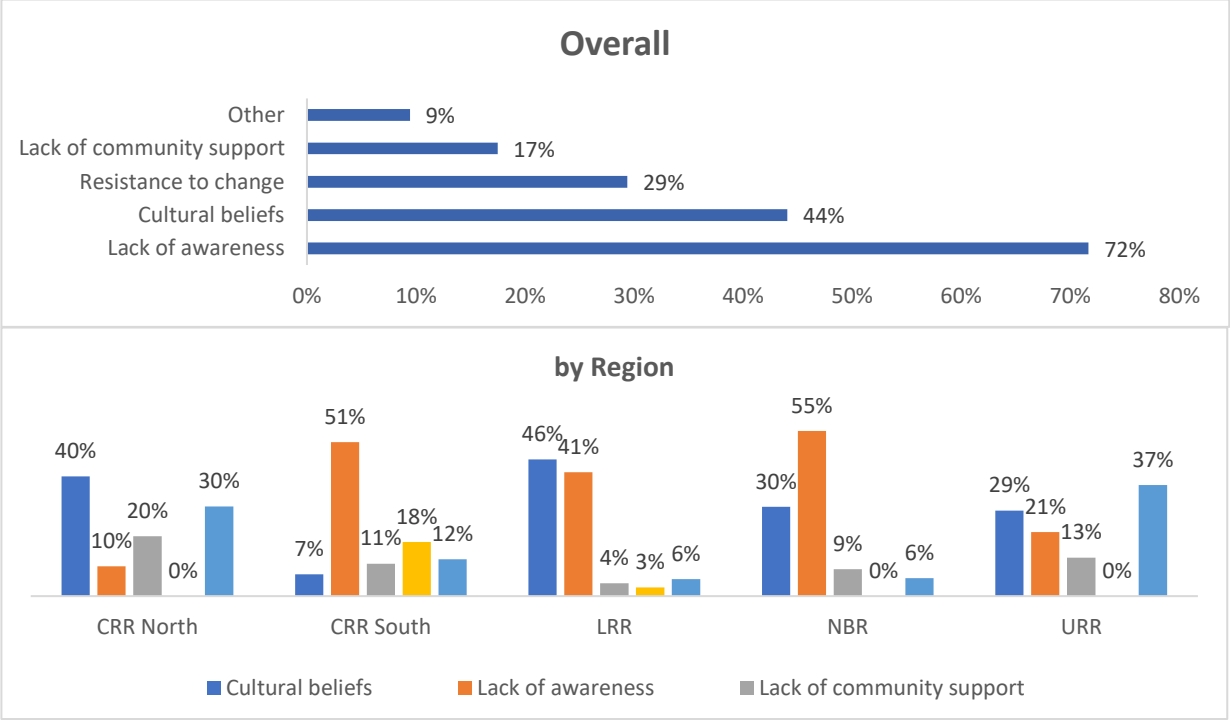
- **Resistance to change**: 37% of respondents in URR identified resistance to change as the main barrier, the highest among all regions. This suggests that even if awareness is raised, overcoming resistance could be more difficult here.
- **Lack of awareness**: 21% of respondents cited lack of awareness, which, while significant, is not as prominent as in other regions.
- **Cultural beliefs**: 29% identified cultural beliefs as a barrier, similar to other regions but not as significant as in CRR North or LRR.

**Conclusion**

- **Lack of awareness** and **cultural beliefs** emerge as the two most common barriers across all regions, suggesting a need for education and awareness campaigns to promote organic fertilizers.
- **Resistance to change** is a prominent issue in **CRR North** and **URR**, meaning these regions might require targeted approaches to overcome deeply rooted opposition.
- **CRR South** and **NBR** show the highest potential for successful adoption once awareness is raised, as resistance to change and cultural beliefs are less significant barriers.

Addressing these barriers requires region-specific strategies, with some regions needing more educational outreach and others requiring a focus on changing cultural perceptions and overcoming resistance to new practices.

## Figure 65: Main social barriers that prevent wider adoption of organic fertilizers



## 7.5: How well-informed do you feel about agroecology

**Overall Analysis**

The figure measures how informed respondents feel about agroecology, with responses grouped into four categories: **Not informed at all**, **Slightly informed**, **Somewhat informed**, and **Very well-informed**. The overall results are:

- **Not informed at all**: 16%
- **Slightly informed**: 34%
- **Somewhat informed**: 22%
- **Very well-informed**: 28%

Most respondents feel either **slightly informed** (34%) or **very well-informed** (28%), suggesting a relatively high level of awareness about agroecology among the population. However, 16% still feel **not informed at all**, pointing to gaps in information dissemination.

**Regional Analysis**

1. **CRR North**:
    - **Not informed at all**: 31% of respondents in CRR North report not being informed about agroecology, one of the highest percentages across regions.
    - **Slightly informed**: 30% feel slightly informed, indicating some awareness but not enough to feel confident about agroecological practices.
    - **Very well-informed**: 17% feel very well-informed, lower than the overall percentage (28%). This suggests that CRR North needs more focused efforts in raising awareness about agroecology.
2. **CRR South**:
    - **Very well-informed**: CRR South reports the highest percentage of respondents (43%) who feel very well-informed about agroecology.
    - **Not informed at all**: Only 11% of respondents feel not informed, which is among the lowest in all regions.
    - This indicates that CRR South has a good level of knowledge dissemination about agroecology, making it one of the most informed regions.
3. **LRR**:
    - **Very well-informed**: 42% of respondents in LRR feel very well-informed, similar to CRR South. This indicates a high awareness level in the region.

- **Not informed at all**: Only 2% of respondents report not being informed, the lowest across all regions, highlighting the success of information dissemination in LRR.

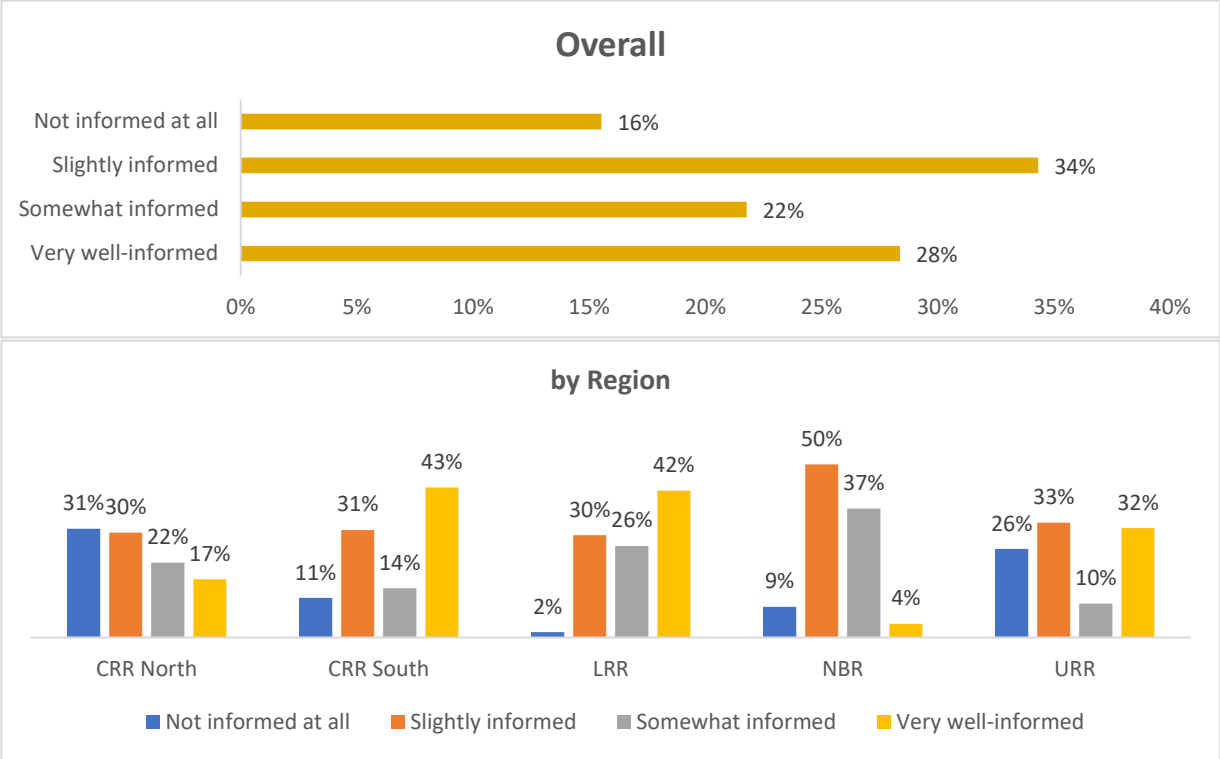
4. **NBR**:
    - **Slightly informed**: NBR has the highest percentage of respondents (50%) who feel slightly informed, suggesting that while there is some awareness, more detailed information could be helpful.
    - **Very well-informed**: Only 4% of respondents feel very well-informed, which is significantly lower than other regions, indicating that while people have heard of agroecology, they may not have an in-depth understanding of it.
5. **URR**:
    - **Very well-informed**: 32% of respondents feel very well-informed, which is above the overall average (28%).
    - **Not informed at all**: However, 26% of respondents report not being informed at all, which is higher than most regions. This suggests a mixed level of awareness, with some highly informed individuals and others completely unaware.

**Conclusion**

- **CRR South** and **LRR** are the regions where respondents feel the most informed about agroecology, with a high percentage of very well-informed respondents and very few who feel not informed at all.
- **CRR North** and **URR** show more significant gaps in information, with over a quarter of respondents in these regions reporting not being informed at all.
- **NBR** has a high proportion of slightly informed respondents, which may indicate the need for deeper engagement to move people from basic awareness to a more thorough understanding of agroecological practices.

This analysis suggests that while overall awareness about agroecology is reasonably high, some regions still require targeted educational initiatives to ensure more widespread and deeper knowledge, particularly in **CRR North**, **URR**, and **NBR**.

## Figure 66: How well-informed do you feel about agroecology




## 7.6: How well-informed do you feel about organic fertilizers

**Overall Analysis**

The chart categorizes respondents based on how well-informed they feel about organic fertilizer, with four levels: **Not informed at all**, **Slightly informed**, **Somewhat informed**, and **Very well-informed**. The overall results are:

- **Not informed at all**: 21%
- **Slightly informed**: 35%
- **Somewhat informed**: 23%
- **Very well-informed**: 20%

The data reveals that the majority of respondents fall under the **slightly informed** category (35%), indicating that while there is some basic awareness about organic fertilizers, there is still significant room for deeper understanding and better information dissemination. Additionally, 21% are **not informed at all**, highlighting a notable gap in awareness.

**Regional Analysis**

1. **CRR North**:
    - **Not informed at all**: A significant 43% of respondents in CRR North report being not informed about organic fertilizers, the highest across all regions. This indicates

a major gap in awareness and suggests that targeted educational efforts are urgently needed.

- **Very well-informed**: 24% feel very well-informed, slightly above the overall average, showing that while some respondents are knowledgeable, a large portion remains uninformed.

2. **CRR South**:
   - **Very well-informed**: 40% of respondents in CRR South feel very well-informed about organic fertilizers, the highest among all regions.
   - **Not informed at all**: Only 25% report being not informed at all, which is relatively lower than CRR North but still significant. This region has a good mix of respondents who are well-informed, but there remains a portion needing more information.
3. **LRR**:
   - **Slightly informed**: A high percentage (50%) of respondents feel slightly informed, indicating that while they may have basic knowledge of organic fertilizers, more in-depth education would be beneficial.
   - **Not informed at all**: Only 8% report being not informed at all, one of the lowest percentages across the regions, indicating relatively good awareness in LRR.
4. **NBR**:
   - **Somewhat informed**: A large portion (49%) of respondents feel somewhat informed about organic fertilizers, which is the highest in this category across regions. This indicates that there is a moderate level of understanding, though only 9% report being very well-informed.
   - **Not informed at all**: Only 1% report being not informed, showing that awareness about organic fertilizers is strong in NBR, though there is room to improve the depth of understanding.
5. **URR**:
   - **Slightly informed**: A large percentage (49%) of respondents feel slightly informed, similar to LRR, indicating that while awareness exists, deeper knowledge is lacking.
   - **Very well-informed**: Only 5% report being very well-informed, the lowest across all regions, suggesting that more targeted information and educational campaigns would be beneficial in URR.

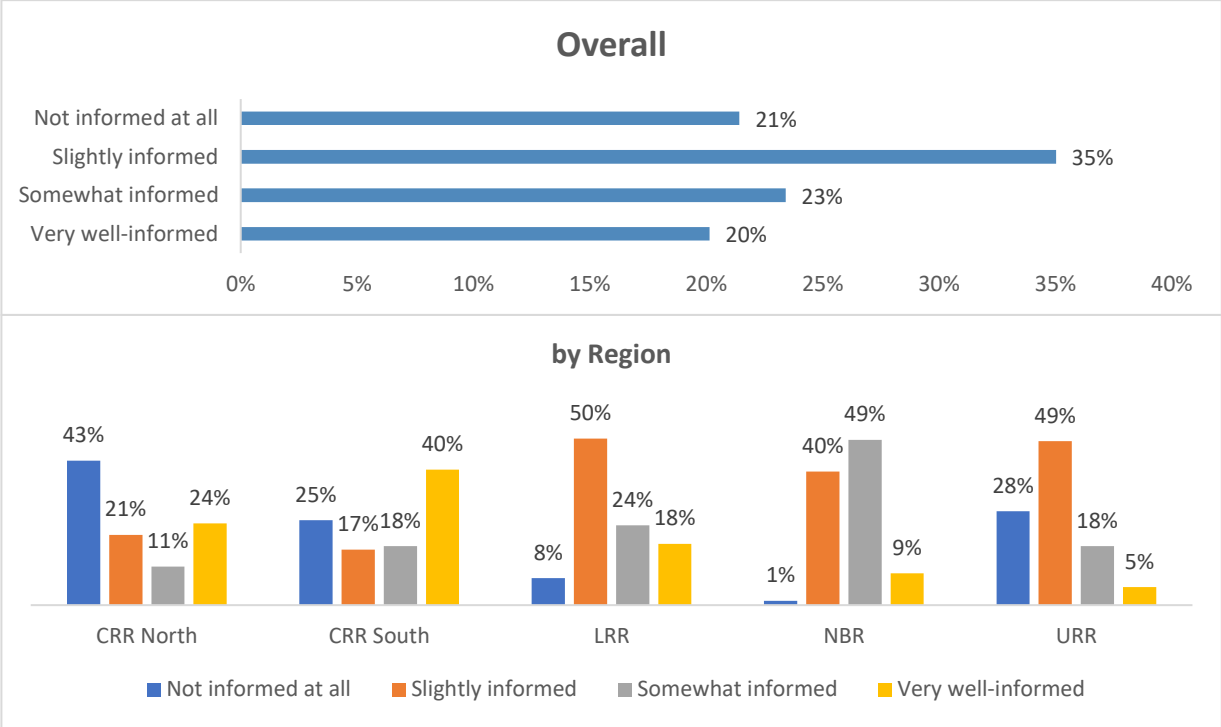
**Conclusion**

- **CRR North** has the largest percentage of respondents who feel **not informed at all** (43%), indicating the greatest need for awareness-raising efforts in this region.

- **CRR South** leads in terms of respondents who feel **very well-informed** (40%), suggesting that awareness campaigns or educational initiatives in this region have been relatively successful.
- **LRR** and **NBR** have a high number of respondents who are **somewhat informed** or **slightly informed**, indicating that while there is moderate awareness, further engagement is needed to enhance understanding.
- **URR** has a large percentage of respondents who feel **slightly informed** (49%), but very few feel **very well-informed**, highlighting the need for more in-depth education in the region.

In summary, while overall awareness of organic fertilizers is present, many regions, especially **CRR North** and **URR**, still show significant gaps in knowledge. Tailored educational initiatives are needed to raise awareness and deepen understanding of organic fertilizers, particularly in these regions.

**Figure 67: How well-informed do you feel about organic fertilizers**




## 7.7: Additional information or training do you think would be beneficial

The figure examines the types of additional information or training that respondents believe would be beneficial for improving their knowledge and practices related to agroecology and organic fertilizer production. The categories include **Access to research and resources**, **Information on climate-resilient farming techniques**, **Training on organic fertilizer production**, and **Workshops on agroecology practices**.

**Overall Analysis**

- **Training on organic fertilizer production** (31%) and **Workshops on agroecology practices** (31%) were the two most commonly identified areas where additional information or training would be beneficial. This reflects a strong demand for hands-on, practical knowledge to improve organic farming practices.
- **Information on climate-resilient farming techniques** was highlighted by 25% of respondents, indicating that many people recognize the importance of adapting to climate change but may lack the specific knowledge or strategies to implement these practices effectively.
- **Access to research and resources** was selected by 13% of respondents, showing that while practical training is prioritized, some respondents also see a need for improved access to research and educational resources.

**Regional Analysis**

1. **CRR North**:
    - **Training on organic fertilizer production**: The majority of respondents (37%) from CRR North identified training on organic fertilizer production as a key area for improvement.
    - **Workshops on agroecology practices** were selected by 34%, showing a similar interest in practical training.
    - **Information on climate-resilient farming techniques** was considered important by 21%, while only 7% indicated a need for access to research and resources.
2. **CRR South**:
    - Respondents here had a balanced distribution of needs, with **Information on climate-resilient farming techniques** (27%) being the most requested.
    - Both **Training on organic fertilizer production** and **Workshops on agroecology practices** were selected by 28% each, showing a demand for both theoretical and practical knowledge.
3. **LRR**:
    - Similar to CRR South, respondents from LRR expressed nearly equal interest in **Training on organic fertilizer production** (28%), **Workshops on agroecology practices** (28%), and **Information on climate-resilient farming techniques** (25%).
    - **Access to research and resources** was seen as important by 19%, slightly higher than in other regions, indicating that access to scientific and technical information may be more limited in this area.
4. **NBR**:
    - Respondents from NBR were most interested in **Training on organic fertilizer production** (34%) and **Workshops on agroecology practices** (33%), with 28% expressing the need for **Information on climate-resilient farming techniques**.

- Only 4% requested **Access to research and resources**, the lowest across all regions.

5. **URR**:
    - Respondents from URR showed similar preferences to NBR, with **Training on organic fertilizer production** and **Workshops on agroecology practices** both selected by 32%.
    - **Information on climate-resilient farming techniques** was selected by 23%, while **Access to research and resources** was identified as important by 13%.

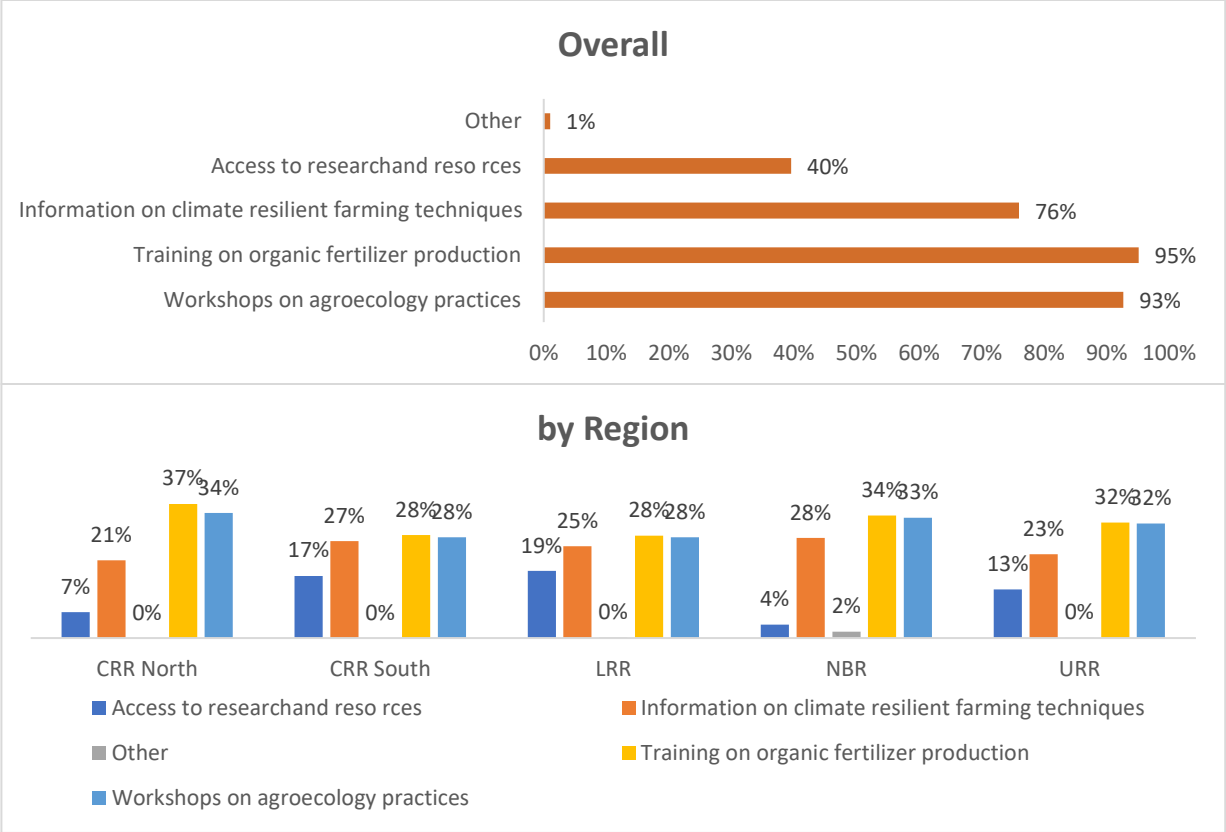
**Conclusion**

- **Training on organic fertilizer production** and **Workshops on agroecology practices** are consistently seen as the most beneficial forms of additional training across all regions. This suggests a strong desire for hands-on, practical knowledge that can be applied directly in the field.
- **Information on climate-resilient farming techniques** is also widely requested, particularly in CRR South and NBR, as farmers recognize the challenges posed by climate change and the need for adaptive strategies.
- **Access to research and resources** is seen as less critical, though it is relatively more important in regions like LRR (19%) and URR (13%), where access to technical information may be more limited.

This data emphasizes the need for targeted training programs that focus on practical skills such as organic fertilizer production and agroecology workshops, while also incorporating elements of climate resilience to help farmers adapt to changing environmental conditions.



## Figure 68: Additional information or training do you think would be beneficial






# J. PARTICIPANT FEEDBACK

## 8.1 Rating of the Clarity of the Survey Questions

Figure 5.1 below reports partcipants' feedback on the clarity of the survey questions in the diagnostic study on agroecology and organic fertilizer across the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how they would rate the overall clarity of the questions in this survey. The cumulative results revealed that 52% of respondents rated the overall clarity of the survey questions as "very clear", while 44% rated the questions as "clear". However, 4% claimed they were "neutral" about the overall clarity of the survey questions.

**Regional Comparative Analysis on Rating of the Clarity of the Survey Questions**

Figure 5.2 below reports participants' feedback on the clarity of the survey questions in the diagnostic study on agroecology and organic fertilizer in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how they would rate the overall clarity of the questions in this survey.

For **CRR-North**, the individual regional survey results show that 71% of respondents rated the overall clarity of the survey questions as "very clear", while 29% rated the questions as "clear".

For **CRR-South**, the individual regional analysis reveals that 62% of respondents rated the overall clarity of the survey questions as "very clear", while 32% rated the questions as "clear". However, 6% claimed they were "neutral" about the overall clarity of the survey questions.

For **LRR**, the survey results show that 73% of respondents rated the overall clarity of the survey questions as "very clear", while 27% rated the questions as "clear".

For **NBR**, the findings show that 74% of respondents rated the overall clarity of the survey questions as "clear", while 23% rated the questions as "very clear". However, 3% claimed they were "neutral" about the overall clarity of the survey questions.

For **URR**, the analysis indicate that 65% of respondents rated the overall clarity of the survey questions as "clear", 23% rated the questions as "very clear", while 1% rated it as "unclear". However, 11% claimed they were "neutral" about the overall clarity of the survey questions.

## 8.2 Ease of Understanding and Responding to the Survey Questions

Figure 5.3 below reports participants' feedback on the ease of understanding and responding to the survey questions in the diagnostic study on agroecology and organic fertilizer across the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how easy was it to understand and respond to the survey questions. The cumulative results revealed that 61% of respondents rated the overall ease of understanding and responding to the survey questions as "easy", 32% rated it as "very easy", 1% while rated the questions as "difficult" to understand. However, 4% claimed they were "neutral" about the overall clarity of the survey questions.



**Regional Comparative Analysis on the Ease of Understanding and Responding to the Survey Questions**

Figure 5.4 below reports participants' feedback on the ease of understanding and responding to the survey questions in the diagnostic study on agroecology and organic fertilizer in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked about how easy was it to understand and respond to the survey questions.

For **CRR-North**, the individual regional survey results show that 56% of respondents rated the ease of understanding and responding to the survey questions as "easy", 43% rated it as "very easy", 1% while rated the questions as "difficult" to understand and respond. However, 4% claimed they were "neutral" about the ease of understanding and responding to the survey questions.

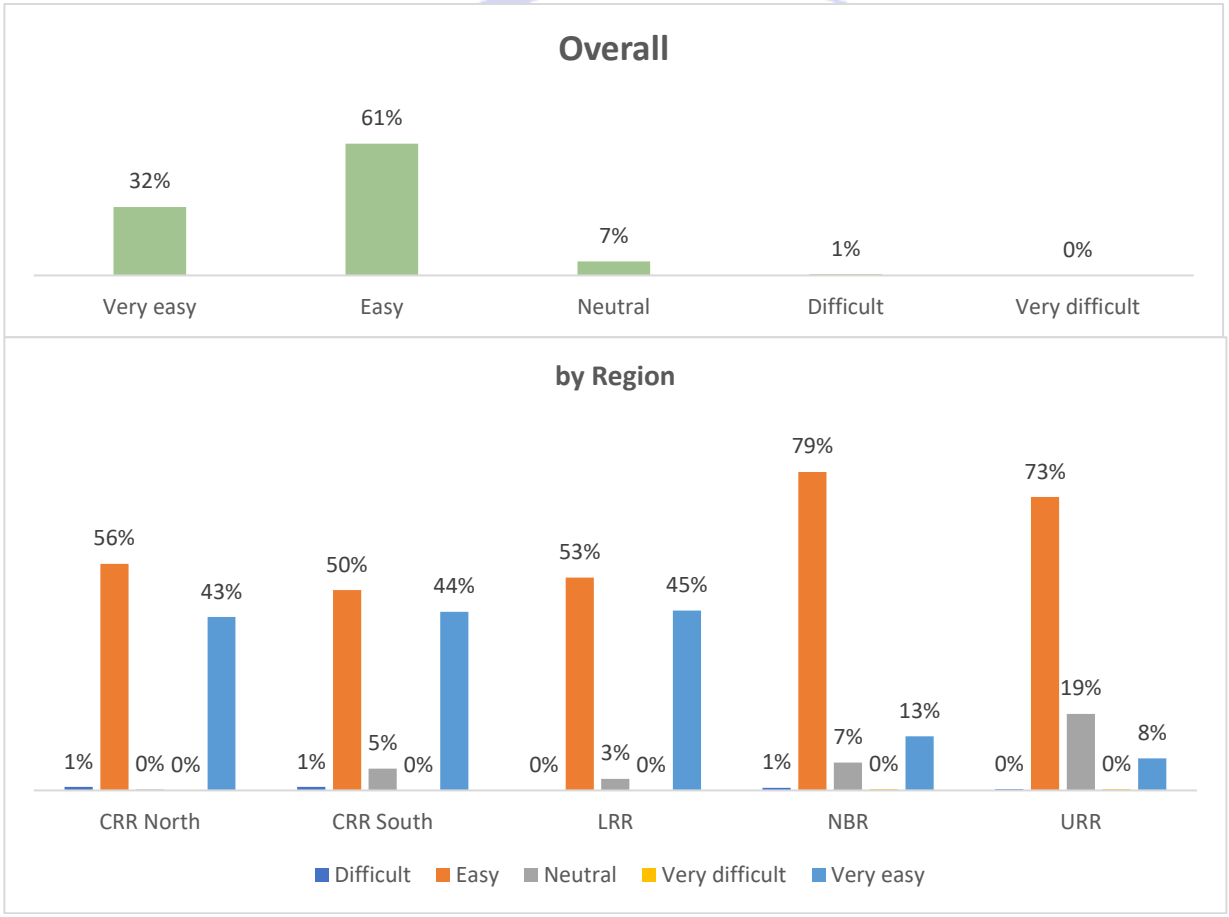
For **CRR-South**, the individual regional analysis reveals that 50% of respondents rated the ease of understanding and responding to the survey questions as "easy", 44% rated it as "very easy", 1% while rated the questions as "difficult" to understand and respond. However, 5% claimed they were "neutral" about the ease of understanding and responding to the survey questions.

For **LRR**, the survey results show that 53% of respondents rated the ease of understanding and responding to the survey questions as "easy", 45% rated it as "very easy". However, 3% claimed they were "neutral" about the ease of understanding and responding to the survey questions.

For **NBR**, the findings show that 79% of respondents rated the ease of understanding and responding to the survey questions as "easy", 13% rated it as "very easy", 1% while rated the questions as "difficult" to understand and respond. However, 7% claimed they were "neutral" about the ease of understanding and responding to the survey questions.

For **URR**, the analysis indicate that 73% of respondents rated the ease of understanding and responding to the survey questions as "easy", while 8% rated it as "very easy", However, 19% claimed they were "neutral" about the ease of understanding and responding to the survey questions.

**Figure 69: Ease of Understanding and Responding to the Survey Questions**




## 8.3 Appropriateness of the Length of the Survey Questionnaire

Figure 5.5 below reports partcipants' feedback on the appropriateness of the length of the survey questionnaire in the diagnostic study on agroecology and organic fertilizer across the five (5) rural

farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked whether the length of the survey questionnaire was appropriate. The cumulative results showed that 81% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", 15% rated it as "too long", while 4% rated it as "too short".

### Regional Comparative Analysis on Appropriateness of the Length of the Survey Questionnaire

Figure 5.6 below reports participants' feedback on the appropriateness of the length of the survey questionnaire in the diagnostic study on agroecology and organic fertilizer in each of the five (5) rural farming regions of CRR-North, CRR-South, LRR, NBR, and URR. Respondents were asked whether the length of the survey questionnaire was appropriate.

For **CRR-North**, the individual regional survey results show that 89% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", while 11% rated it as "too long".

For **CRR-South**, the individual regional analysis reveals that 75% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", 19% rated it as "too long", while 5% rated it as "too short".

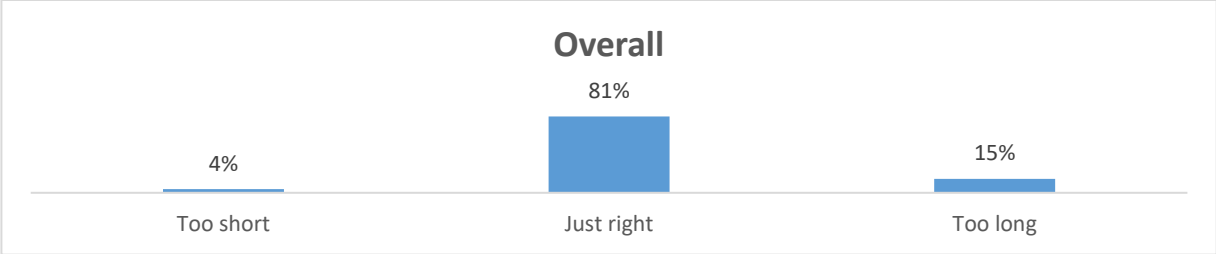
For **LRR**, the survey results show that 73% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", 18% rated it as "too long", while 9% rated it as "too short".

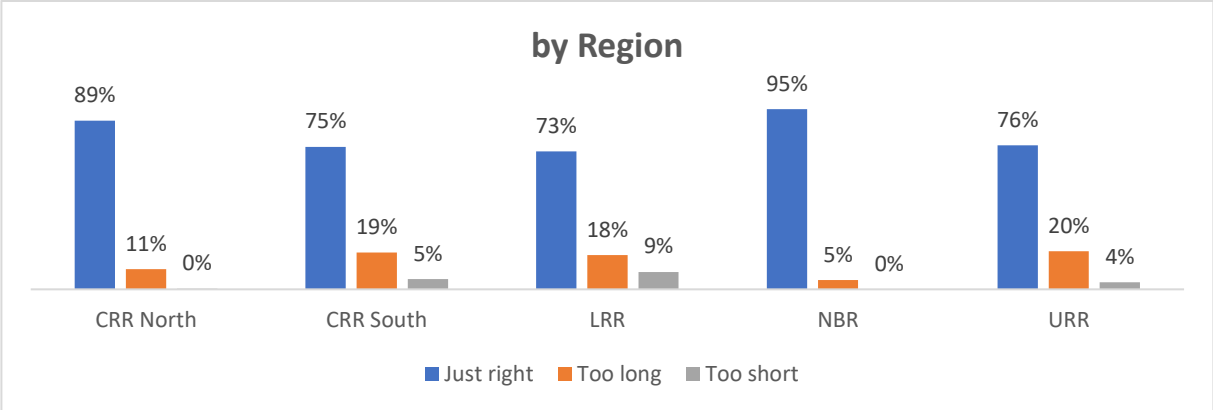
For **NBR**, the findings show that 95% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", while 5% rated it as "too long".

For **URR**, the analysis indicates that 76% of respondents rated the appropriateness of the length of the survey questionnaire as "just right", 20% rated it as "too long", while 4% rated it as "too short.



**Figure 70: Appropriateness of the Length of the Survey Questionnaire**




**Integration of Feedback from the National Validation Workshop**

As the next step in finalizing the diagnostic study, feedback received from the national validation workshop will be carefully integrated into the final version of the report. This will ensure that the study reflects the broader perspectives of key stakeholders and addresses any concerns or recommendations provided during the validation process. The incorporation of this feedback will enhance the robustness of the findings and strengthen the policy recommendations aimed at scaling agroecology and organic fertilizer production in The Gambia.

# 10.1.2 Regional Comparison Analysis (FGD data)

## Introduction

The **Focus Group Discussions (FGDs)** were conducted to explore perceptions, challenges, and opportunities related to agroecology and organic fertilizer production in The Gambia. Participants included both youth and women, who are key stakeholders in agroecology. The FGDs were aimed at understanding the factors impacting their involvement, the quality of training programs, and the challenges they face in implementing sustainable agricultural practices. Insights gathered during the discussions highlighted both opportunities and socio-economic impacts that could shape future interventions.

## Thematic Analysis

### 1. Challenges in Agroecology

- **Access to Land and Fencing**: One of the major challenges identified was access to sufficient land for agroecology practices. While some participants mentioned that land was available, securing it with proper fencing was a significant problem. Without adequate fencing, crops were often eaten by animals, which greatly reduced productivity. Participants emphasized the need for better infrastructure and fencing to protect their agroecological investments (FGD_URR & NBR).
- **Water Access and Irrigation**: Limited access to water for irrigation was another recurring issue. In many areas, water is not easily accessible, and the lack of irrigation facilities limits the ability to grow crops year-round. This challenge hampers agroecology practices, particularly during the dry season (FGD_URR & NBR).

### 2. Challenges in Organic Fertilizer Production

- **Lack of Tools and Equipment**: Communities faced significant difficulties in accessing the tools required for organic fertilizer production. Participants expressed frustration over the lack of wheelbarrows, compost chambers, and other basic equipment needed to handle raw materials. The absence of these tools makes organic fertilizer production labor-intensive and inefficient (FGD_URR & LRR).
- **Raw Material Availability**: While raw materials for organic fertilizer production were generally available, some communities faced challenges related to the transportation of these materials. High transportation costs and long distances to sourcing locations limited the production capacity, making it difficult to produce enough fertilizer for large-scale use (FGD_URR & CRRS).

### 3. Impact of Climate Change on Agroecology

- **Unpredictable Weather Patterns**: Climate change has exacerbated the challenges faced by farmers practicing agroecology. Participants reported that irregular rainfall and changing weather patterns have made it difficult to predict planting and harvesting seasons.

This unpredictability has led to crop failure and reduced yields in many cases (FGD_CRRN & NBR).

- **Increased Pest Infestation**: The changing climate has also increased the prevalence of pests, further threatening agroecology practices. Participants noted that they have had to resort to using local pesticide alternatives due to the increased presence of pests affecting their crops (FGD_URR & NBR).

## 4. Engagement in Agroecology

- **Youth and Women Engagement**: Both youth and women are actively involved in agroecology, but their engagement is hindered by a lack of resources. Women, in particular, face challenges related to insufficient land, poor fencing, and the lack of market access for their products. Youths, on the other hand, expressed a willingness to engage but cited financial constraints and the need for better support as barriers to their full participation (FGD_CRRN, NBR, CRRS & URR).
- **Training and Knowledge Sharing**: Participants had received training on compost making and agroecological practices, but they often lacked the necessary materials to implement the skills they had learned. The knowledge gained from training was viewed positively, but without the required resources, the impact of these programs was limited (FGD_CRRN, NBR, CRRS & URR).

## 5. Opportunities for Implementation of Agroecology

- **Potential for Scaling**: Participants showed great interest in scaling up agroecological practices. They emphasized that with the right support, including access to land, fencing, and water, they could increase productivity and contribute to local food security. The availability of local expertise, such as trained extension workers, also presents an opportunity to further develop agroecology (FGD_URR, LRR & NBR).
- **Community Involvement**: There is strong community engagement in agroecology, with both youth and women eager to contribute. With adequate support from government and donor agencies, the implementation of agroecological practices could be significantly improved (FGD_CRRN, NBR & URR).

## 6. Opportunities for Organic Fertilizer Production

- **Cost-Effective Alternative to Chemical Fertilizers**: Organic fertilizer production presents a viable and cost-effective alternative to chemical fertilizers, especially given the rising costs of the latter. Participants mentioned that organic fertilizers are cheaper and more accessible, making them an attractive option for farmers who cannot afford chemical fertilizers (FGD_CRRN, NBR & URR).

- **Local Market Potential**: There is potential to create a local market for organic fertilizers. While current production levels are low, participants expressed confidence that with proper support and access to tools, they could produce enough to meet local demand and even supply neighboring communities (FGD_CRRN, NBR & URR).

## 7. Socio-Economic Impact

- **Economic Benefits of Agroecology**: Agroecology offers opportunities for economic growth, particularly for women and youth. Participants noted that with better access to land and resources, they could increase their income through higher crop yields and organic fertilizer production. The potential for establishing local markets for organic products could also contribute to community economic development (FGD_CRRN, NBR & URR).

- **Empowerment of Marginalized Groups**: Agroecology and organic fertilizer production have the potential to empower marginalized groups, including women and persons with disabilities. By providing access to resources, training, and markets, these practices could enhance the socio-economic status of vulnerable populations (FGD_CRRN, NBR & URR)

.

## Conclusion

The **FGDs** revealed both the challenges and opportunities for agroecology and organic fertilizer production across The Gambia's rural farming regions. Despite significant engagement from youth and women, there are limitations stemming from a lack of tools, resources, and access to markets. Climate change further complicates farming practices with unpredictable weather patterns and increased pest infestations. However, with targeted interventions—such as improved access to land, water, fencing, and modern tools—there is considerable potential for scaling up agroecology and organic fertilizer production. This could result in substantial socio-economic benefits for local communities, particularly for marginalized groups.

**Contextual Insights on Regional Performance:** Regions such as CRR-North performed better in terms of engagement and productivity due to better training programs and community involvement. However, regions like URR faced more significant challenges, particularly related to land access and irrigation infrastructure, which hindered their ability to fully embrace agroecology. This analysis underscores the need for region-specific support and resources to address the unique challenges faced by each area, ensuring that future interventions are tailored to the local context and meet the specific needs of the communities involved.

# Conclusion And Recommendations

## Conclusion

The diagnostic study on agroecology and organic fertilizer production across key farming regions in The Gambia highlights several critical challenges and opportunities. There is a strong community engagement in agroecology, particularly among youth and women, but their efforts are hindered by a lack of resources, such as access to tools, raw materials, and necessary infrastructure. The study reveals that despite their willingness to adopt sustainable farming practices, many farmers lack the requisite skills and support, limiting the scalability of agroecological initiatives.

Climate change has significantly impacted agricultural productivity in these regions. Challenges such as flooding, rising temperatures, soil degradation, and increased pest and disease outbreaks have affected both agroecology and organic fertilizer production. In regions like CRR North and URR, the absence of adequate infrastructure and tools has further compounded these challenges, making it difficult for communities to cope with the effects of climate change.

On the other hand, opportunities exist for improving organic fertilizer production and agroecology practices. The potential for cost-effective organic fertilizer production as a substitute for expensive chemical fertilizers presents an economic advantage, especially for smallholder farmers. With better support, including access to modern tools, land, and training, organic fertilizer production can be scaled to meet local and regional market demands.

The study also found that despite efforts to promote agroecology, there is a significant gap in market access, which discourages farmers from fully engaging in sustainable farming practices. Addressing these barriers, particularly by creating better market linkages and improving infrastructure, will be critical for the successful implementation of agroecology.

## Recommendations

To scale up agroecology and organic fertilizer production in The Gambia, a multi-faceted approach is essential. The recommendations below are categorized into **Policy**, **Infrastructure**, and **Training** actions, with a strong emphasis on building partnerships with donor agencies to ensure long-term benefits for food security and rural development.

### 1. Policy Recommendations

- **Support Inclusive Agricultural Policies:**
    - Governments should enact policies that prioritize agroecology and organic fertilizer production as part of the national agricultural strategy. These policies should also focus on equitable access to resources for marginalized groups, such as women, youth, and persons with disabilities.

- Establish a regulatory framework to support the certification of organic fertilizers, ensuring that products meet quality standards and incentivizing farmers to transition to organic inputs.

- **Climate Resilience Policies:**
  - Develop and implement climate-smart agriculture policies that support the use of drought-resistant crops and flood management strategies. Encourage the use of organic pesticides and integrated pest management (IPM) techniques to promote environmental sustainability.

- **Market Development Initiatives:**
  - Facilitate policy support for the establishment of local and regional markets for organic fertilizers and agroecological products. This could include tax breaks or subsidies for agroecological farmers to incentivize sustainable practices.

**2. Infrastructure Recommendations**

- **Increase Access to Tools and Equipment:**
  - **Priority Regions:** CRR North and URR should be targeted for investment in essential tools, such as wheelbarrows, compost pits, and production equipment.
  - **Actionable Steps:** Governments and donor agencies can create subsidized programs or leasing mechanisms to help farmers access these tools affordably.

- **Develop Composting and Storage Facilities:**
  - Invest in composting chambers and organic fertilizer storage facilities, especially in CRR North, URR, and other under-resourced regions. These facilities will help preserve organic materials, increase efficiency, and promote year-round production.
  - Improve access to water through the development of irrigation systems and water reservoirs, particularly in drought-prone areas.

- **Support Rural Transport and Supply Chains:**
  - Establish transportation networks to enhance supply chains for organic fertilizers. This can be done through partnerships between governments, donors, and private sector companies to improve rural logistics, ensuring farmers can distribute products efficiently.

**3. Training Recommendations**

- **Comprehensive Training for Farmers:**
  - Provide widespread training programs on agroecology practices, focusing on composting, crop rotation, and pest control. Include follow-up support to ensure the adoption of best practices.

- **Actionable Steps:** Donor-supported technical assistance programs should partner with local agricultural extension services to provide ongoing mentorship and field demonstrations.

- **Inclusive Training Initiatives:**
  - Ensure training programs are inclusive of women, youth, and persons with disabilities. Create specific training modules tailored to the needs of these groups, ensuring they can participate fully in agroecological interventions.
  - **Actionable Steps:** Partner with NGOs and community organizations to mobilize women and youth-led initiatives, offering training grants or toolkits to support their efforts.

- **Capacity Building for Cooperatives:**
  - Strengthen the capacities of local agricultural cooperatives through leadership and business management training. Empower women to take on leadership roles within these cooperatives, increasing their influence and decision-making power in agroecology practices.
  - **Actionable Steps:** Governments, with donor support, should offer micro-grants or low-interest loans to agricultural cooperatives to facilitate the procurement of tools and raw materials.

**4. Donor Partnerships for Sustainable Development**

- **Long-term Investment in Agroecology:**
  - Donor agencies should focus on long-term sustainability by fostering partnerships between local organizations and international donors. This can be done through multi-year funding commitments aimed at supporting organic fertilizer production, training programs, and infrastructure development.
  - **Actionable Steps:** Create a partnership platform where donors, government agencies, and local farmers' groups can collaborate on designing and implementing agroecological interventions. This platform should promote transparency, shared knowledge, and capacity building.

- **Capacity Building and Technical Expertise:**
  - Donors can also contribute technical expertise in climate-smart agriculture, agroecology, and organic fertilizer production. Establish technical exchange programs that allow local agricultural experts to collaborate with international researchers and practitioners.
  - **Actionable Steps:** Governments should facilitate the creation of a technical assistance fund, supported by donors, to allow local farmers to access expert advice and training.

- **Food Security and Socio-Economic Well-being:**

- By scaling up organic fertilizer production and agroecology, The Gambia can improve food security while promoting rural development. Donor agencies should work closely with governments to ensure that their support aligns with national development strategies, particularly in rural areas.
- **Actionable Steps:** Formulate a national agroecology strategy with donor input that ties organic fertilizer production to broader goals of enhancing rural livelihoods and food security.

These targeted policy, infrastructure, and training actions, when combined with robust partnerships with donor agencies, can significantly enhance the agroecology sector and organic fertilizer production in The Gambia. By addressing tool shortages, training gaps, and infrastructure challenges, the country can improve food security, boost rural development, and create a sustainable agricultural ecosystem.

## Limitations

The study faced logistical constraints, including challenges in reaching remote areas, which may have limited the breadth of data collection and potentially led to underrepresentation of certain regions. Additionally, the data collectors did not engage in detailed probing during Focus Group Discussions (FGDs), which limited the depth of qualitative insights into the underlying reasons behind engagement levels in agroecology and organic fertilizer production. This lack of in-depth exploration may have affected the richness of the data and the ability to fully understand participants' motivations and barriers.



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## APPENDIX A: Krejcie and Morgan Table

**Table 1: Krejcie and Morgan Table**

| *N* | *S* | *N* | *S* | *N* | *S* |
|---|---|---|---|---|---|
| 10 | 10 | 220 | 140 | 1200 | 291 |
| 15 | 14 | 230 | 144 | 1300 | 297 |
| 20 | 19 | 240 | 148 | 1400 | 302 |
| 25 | 24 | 250 | 152 | 1500 | 306 |
| 30 | 28 | 260 | 155 | 1600 | 310 |
| 35 | 32 | 270 | 159 | 1700 | 313 |
| 40 | 36 | 280 | 162 | 1800 | 317 |
| 45 | 40 | 290 | 165 | 1900 | 320 |
| 50 | 44 | 300 | 169 | 2000 | 322 |
| 55 | 48 | 320 | 175 | 2200 | 327 |
| 60 | 52 | 340 | 181 | 2400 | 331 |
| 65 | 56 | 360 | 186 | 2600 | 335 |
| 70 | 59 | 380 | 191 | 2800 | 338 |
| 75 | 63 | 400 | 196 | 3000 | 341 |
| 80 | 66 | 420 | 201 | 3500 | 346 |
| 85 | 70 | 440 | 205 | 4000 | 351 |
| 90 | 73 | 460 | 210 | 4500 | 354 |
| 95 | 76 | 480 | 214 | 5000 | 357 |
| 100 | 80 | 500 | 217 | 6000 | 361 |
| 110 | 86 | 550 | 226 | 7000 | 364 |
| 120 | 92 | 600 | 234 | 8000 | 367 |
| 130 | 97 | 650 | 242 | 9000 | 368 |
| 140 | 103 | 700 | 248 | 10000 | 370 |
| 150 | 108 | 750 | 254 | 15000 | 375 |
| 160 | 113 | 800 | 260 | 20000 | 377 |
| 170 | 118 | 850 | 265 | 30000 | 379 |
| 180 | 123 | 900 | 269 | 40000 | 380 |
| 190 | 127 | 950 | 274 | 50000 | 381 |
| 200 | 132 | 1000 | 278 | 75000 | 382 |
| 210 | 136 | 1100 | 285 | 1000000 | 384 |

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970