



RURAL REGIONS AND THE EFFECTS OF CLIMATE CHANGE ON LONG-TERM GROWTH

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ABSTRACT

Climate change will amplify the hazards to human security already posed by things like political instability, economic weakness, water shortages, food security, and mass migration. The main aim of the study is rural regions and the effects of climate change on long-term growth. In this study, primary and secondary data were used to provide a comprehensive analysis and descriptive narrative of the interplay between climate change and long-term economic growth. One of the most pressing problems of our day is climate change. One industry particularly vulnerable to climate change is agriculture, which relies on factors such as precipitation and temperature.

Keywords: *Climate, Growth, economic, temperature, precipitation*

1. INTRODUCTION

Climate change will amplify the hazards to human security already posed by things like political instability, economic weakness, water shortages, food security, and mass migration. Droughts and floods will become more often, and rainfall patterns will shift, causing the most damage to developing nations. According to the assessment, more than a billion people in Asia might be in danger by 2050 due to a decrease in fresh water supply in most locations. Diarrheal diseases, such as those caused by floods and drought, and cholera, which is caused by warmer sea temperatures, are predicted to cause more fatalities and illnesses. Because of its effects on agriculture, water supply, public health, the economy, and energy use, climate change is one of the world's most pressing environmental problems. Combating climate change calls for in-depth scientific knowledge and concerted international and national efforts. For the most part, the industrialised world is to blame for the rise in greenhouse gas emissions, but in the future, it is expected that emerging nations will contribute a greater share than they have in the past. Food production, water supply, coastal communities, forest ecosystems, health, energy security, and so on might all be

affected by the predicted climate change under different scenarios. Communities in underdeveloped nations are less prepared to adjust to the effects of climate change. The United Nations Framework Convention on Climate Change and the terms of the Kyoto Protocol are manifestly insufficient to handle the challenge posed by climate change. Using ecologically friendly technology and promoting energy efficiency, renewable energy, forest conservation, reforestation, water conservation, etc. are the most efficient ways to combat climate change via sustainable development. Reducing the exposure of natural and socioeconomic systems to the predicted climate change is the top priority for emerging nations. Promoting mitigation and adaptation techniques, carrying the expense of such an endeavour, and considering the consequences for economic growth would be a challenge for India and other emerging nations.

1.2 CLIMATE CHANGE

Conditions of the atmosphere and the planet's average temperature have a significant impact on human health, crop yields, and general prosperity (IPCC, 2001a). Because of this, natural ecosystems and the health of living beings everywhere would be negatively impacted by a change in the weather or climate. In this setting, climate is defined as "the average weather in terms of the mean and its variability over a specific time-span and a certain region" by the Intergovernmental Panel on Climate Change (IPCC). The existence or lack of mountains, the latitude of a region, its proximity to the ocean, the kind of plants and animals that thrive there, and other variables all contribute to the wide range of local climates. The climate also changes through time, whether measuring in terms of a single season, a single year, a single decade, or something much longer like the Ice Ages (IPCC, 2001a).

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be recognised by changes in the mean and/or the variability of its attributes and that continues for a prolonged time, generally decades or more" (2007a). Natural internal processes, external forcings, or long-lasting human changes in atmospheric composition or land use are all potential causes of climate change. In contrast to the definition used by the Framework Convention on Climate Change (UNFCCC, 1992), which defines climate change as "a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods," our definition emphasises the role that humans play in causing climate change.

2. LITERATURE REVIEW

Rama, H.-O & Roberts(2022) Human-caused climate change has had far-reaching negative effects on both nature and humans, as the study reveals the significant linkages between the natural, social, and climatic systems. The most vulnerable populations and infrastructures are hit the hardest by climate extremes, and these effects are seen across sectors and geographies. The

report stresses the significance of keeping global warming below 1.5°C for a just, equitable, and sustainable future. While the evaluation found that adaptation is possible and can help lessen the negative effects on people and the environment, it also noted that adaptation has its limitations and that more has to be done to combat climate change. These results, along with others, validate and expand our knowledge of the significance of climate-resilient development across sectors and geographies, and they need the immediate attention of policymakers and the general public.

Muzari, Washington & Mutambara, Jackqeline (2022) Rural areas are particularly vulnerable to the harmful effects of climate change. Certain effects, however, may turn out to be advantageous. Agriculture and food security, water and sanitation, human health, energy, ecosystems, biodiversity, fisheries and animals, and sustainable lifestyles are only few of the topics covered in this book about the effects of climate change. Reduced crop yields in rain-fed agriculture are only one of the negative effects of climate change. Reduced crop yields have a direct impact on smallholder farmers' ability to provide for their families and increase the prevalence of malnutrition. A lack of proper nutrition leads directly to impaired growth and learning in children, decreased productivity in adults, and increased vulnerability to illness. Strategies for adapting to climate change rely heavily on input from many stakeholders. Action done to address the risks and priorities identified at the local level has to be in sync with policies produced and executed at higher levels for the former to be successful. To lessen their exposure to the negative effects of climate change, communities must coordinate efforts among non-governmental organisations (NGOs), municipal governments, companies, and vulnerable community members.

al, H.-O & Simpson, Nicholas & Trisos (2022) fresh information and updates from the AR6 cycle are included in three supplemental reports. The three special reports are the Special Report on Climate Change and Land, which focuses on climate change, desertification, and efforts to eradicate poverty; the Special Report on Global Warming of TS 1.5°C (2018), an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways; and the Special Report on Global Warming of TS 1.5°C (2018), an IPCC special report on the impacts of global warming of 2.0°C above pre-industrial levels and related global greenhouse (2019). Contributing to the Synthesis Report is the WGII assessment, which combines the work of the WGI (the physical scientific base) and WGIII (the mitigation of climate change).

Martin, Maria & Boakye, Emmanuel & Boyd (2022) These considerations were selected from responses to a worldwide open appeal that invited contributions from a wide variety of academic fields. These include: (1) emerging regional vulnerability hotspots due to climate impacts and human vulnerability; (2) new threats on the horizon for climate-health, some of which involve plants and animals; (3) the importance of anticipatory action; (4) climate (im)mobility; (5) security and climate; (6) sustainable land management as a prerequisite to land-based solutions; and (7) sustainable finance practises in the private sector. Brief Overview of Major Social

Networks In order to avoid limitations in adaptability across a wide range of domains, scientific knowledge is available on obstacles to mitigation and how to overcome them.

Dennis, Ewubare& Sammy, Ajisafe (2018)World Development Indicators (WDI) data was used, and several statistical methods (descriptive statistics, a unit root test, a Hansen cointegration test, and Fully-Modified Least Squares) were used to examine the information (FMOLS). Results from the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) unit test indicate that the variables are mixed integrated with various mixtures of I(0) and I. (1). Based on the results of a Hansen test for cointegration, it was found that the variables are, in fact, cointegrated (test statistic = 0.192). Hence, it seems like we can't rule out the possibility of a constant value for the parameters, or the null hypothesis. Precipitation and temperature were shown to significantly influence changes in access to improved water supply in rural Nigeria based on an estimated cointegrating regression model. Yet, temperature shifts improved rural water supplies whereas precipitation reductions had the opposite effect. The flooding that often follows rainstorms is likely to blame for how rain and snow may ruin a rural area's water supply. On the other hand, there is no correlation between per capita CO2 emissions and the availability of better water infrastructure in rural areas. After analysing the data, researchers suggested that policymakers use proactive and creative measures to combating climate change and enhancing rural development prospects via collaboration with the appropriate stakeholders.

3. METHODOLOGY

In this study, primary and secondary data were used to provide a comprehensive analysis and descriptive narrative of the interplay between climate change and long-term economic growth. Researchers used an Interview Schedule to acquire in-depth information from a randomly selected subset of the population. Books, papers, journals, magazines, other published and unpublished materials, website content, etc. are all examples of secondary sources.

Data Collection Tools

A well-structured and pilot-tested interview schedule with respondents was used to gather data on climate change and its effects on sustainable development in the region under investigation. The interview technique refers to research in which data is gathered via direct communication between the researcher and the respondents in the form of questions. In order to collect the necessary baseline data for this research and ensure that respondents are able to react freely and honestly to sensitive questions regarding climate change, an interview schedule is the best option.

4. RESULTS

4.1 DEMOGRAPHICS PROFILE OF THE STUDY

An individual's ability to make sound judgements and meet their own needs is a function of several factors, one of the most telling of which is their age. Risk tolerance is essential for farming, and it plays a significant role in encouraging people to take up the profession. As a result, the research took into account the ages of the participants. Respondents' completed years of age were gathered and sorted into three categories: young (up to 35 years), medium, and elderly (35-45 years) (more than 45 years).

Table 4.1 according to their age

Category	Number	Per cent
Young(Upto35years)	44	11.50
Middle(35-45years)	165	43.00
Old(Morethan45years)	175	45.50
Total	384	100.00

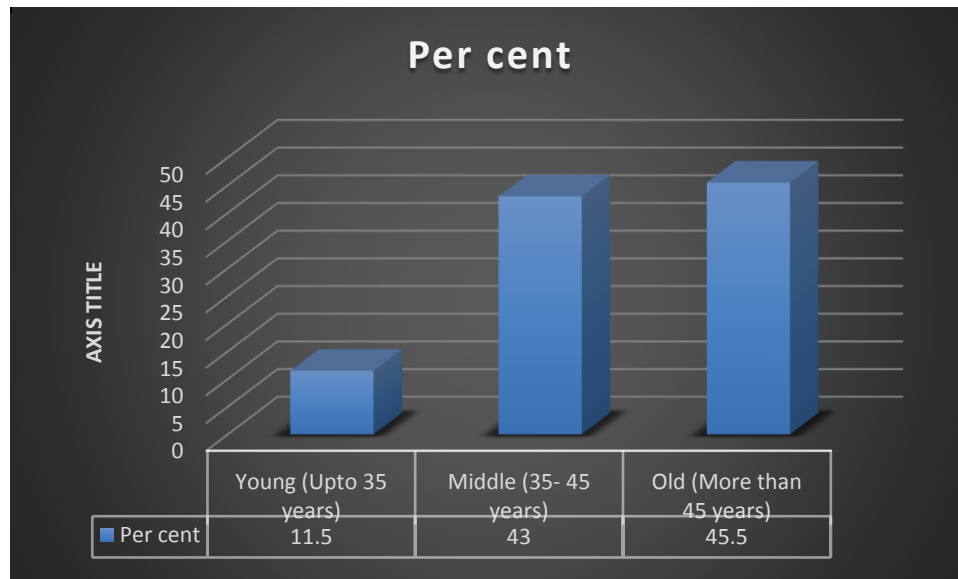


Figure 4.1 according to their Age

4.1.2 Educational status

Education is a method of modifying student behaviour for the better. The more educated a person is, the more likely he is to seek out new information and use what he has learned. It is often assumed that a person's degree of knowledge and adaptability will increase with their educational level. Table 4.2 displays the findings of a survey that asked respondents where they were in terms of a scale running from complete illiteracy to high school graduation.

Table 4.2 according to their educational status

Category	Number	Per cent
Illiterate	31	8.00
Functionally literate	64	17.00
Primary education	100	26.00
Middle education	131	34.00
Secondary education	49	12.50
Collegiate education	10	2.50
Total	384	100.00

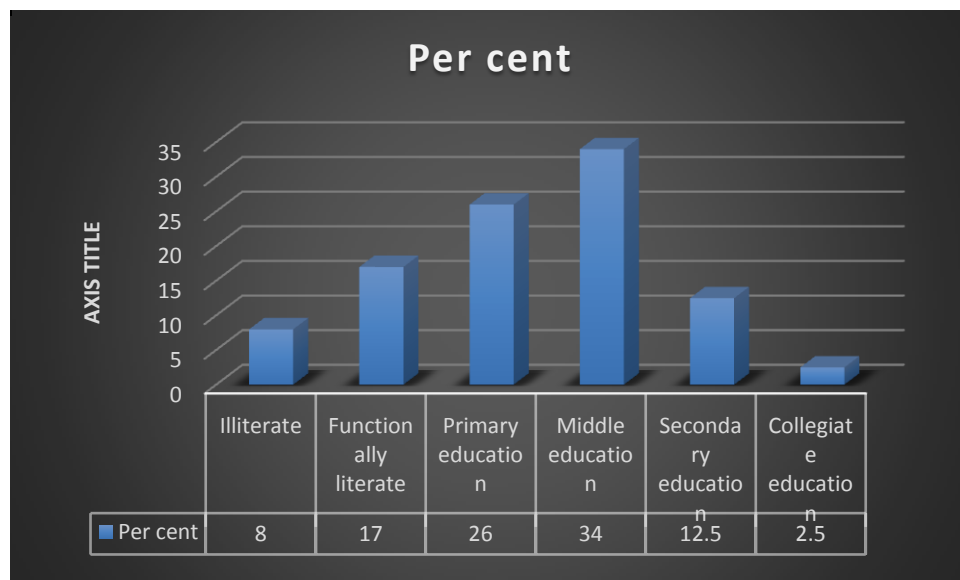


Figure 4.2 according to their educational status

4.1.3 Annual income

Gross annual income was calculated by adding a respondent's agricultural revenue to their other annual earnings. Money has a wide range of effects on people's actions. There were three levels assigned to the respondents: low, medium, and high. Table 4.3 displays the obtained outcomes.

Table 4.3 based on their annual income

Category	Number	Per cent
Low(UptoRs50,000)	113	29.50
Medium(Rs50,000 to 100,000)	200	52.00
High(AboveRs100,000)	71	18.50
Total	384	100.0

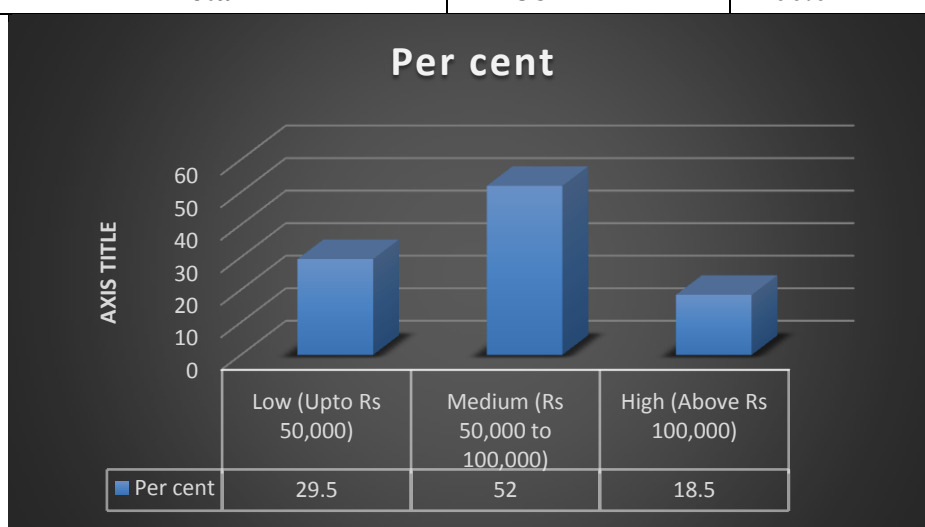


Figure 4.3 based on their annual income

4.1.4 Occupational status

Respondents' socioeconomic standing was determined by the percentage who reported working in agriculture for a living. Table 4.4 displays the obtained data with regards to the employment status.

Table 4.4. based on their occupational status

Category	Number	Percent
Farmingassoleprofession	244	63.50
Farming+Agriciculturallabour	52	13.50
Farming+Business	73	19.00
Farming+Services(Salariedpersons)	15	4.00
Total	384	100.00

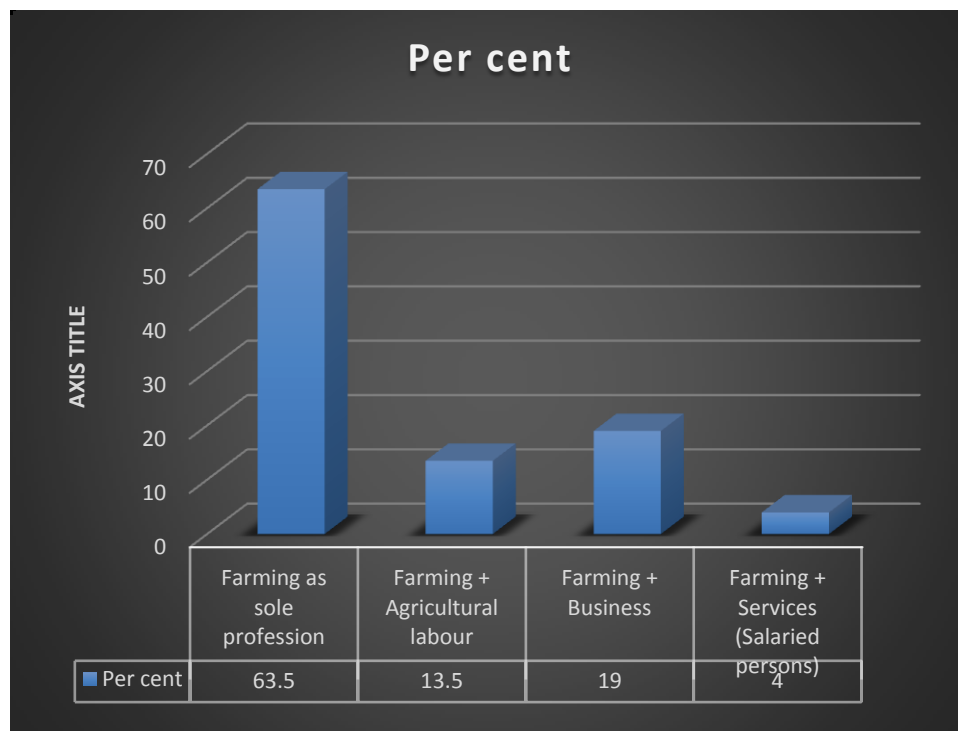


Figure 4.4 based on their occupational status

4.2 KNOWLEDGE LEVEL OF RESPONDENTS ON CLIMATE CHANGE

The term "knowledge" has been used to refer to a person's ability to access and use a body of information that is consistent with commonly accepted truths. The knowledge people have leads them to act in specific ways. In order for farmers to fully appreciate a technology and its benefits, they need to be well-informed about it. As a result, an effort was undertaken to evaluate the existing information.

Table 4.5 based on their knowledge level

Category	Number	Per cent
Low	48	12.50
Medium	211	55.00
High	125	32.50
Total	384	100.00

Based on the responses in Table 4.5, it seems that 55.50 percent of the sample has a moderate understanding of climate change. Around a third (32.50%) of respondents were classified as

having an advanced level of knowledge, while about the same proportion (12.50%) were classified as having a basic level of understanding.

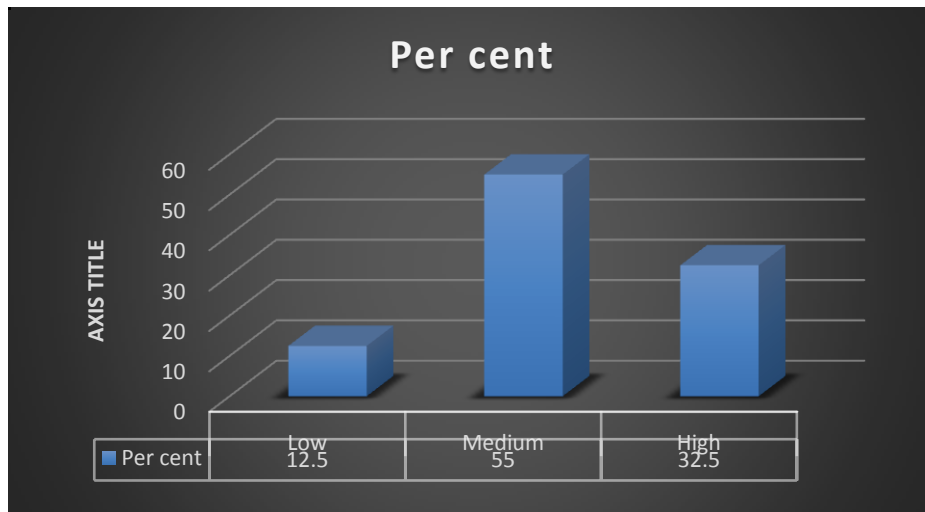


Figure 4.5 according to their knowledge level on climate change

4.2.1 Awareness

Agriculture is vulnerable to climatic fluctuations, particularly precipitation. Since agriculture is so dependent on the monsoon and other climatic characteristics, even a little deviation from the usual in precipitation may have a devastating effect on harvests. For this reason, knowing how well-informed farmers are about climate change is crucial.

Table 4.6 overall awareness level on climate change

Category	Number	Per cent
Low	44	11.5
Medium	275	71.5
High	65	17.0
Total	384	100.00

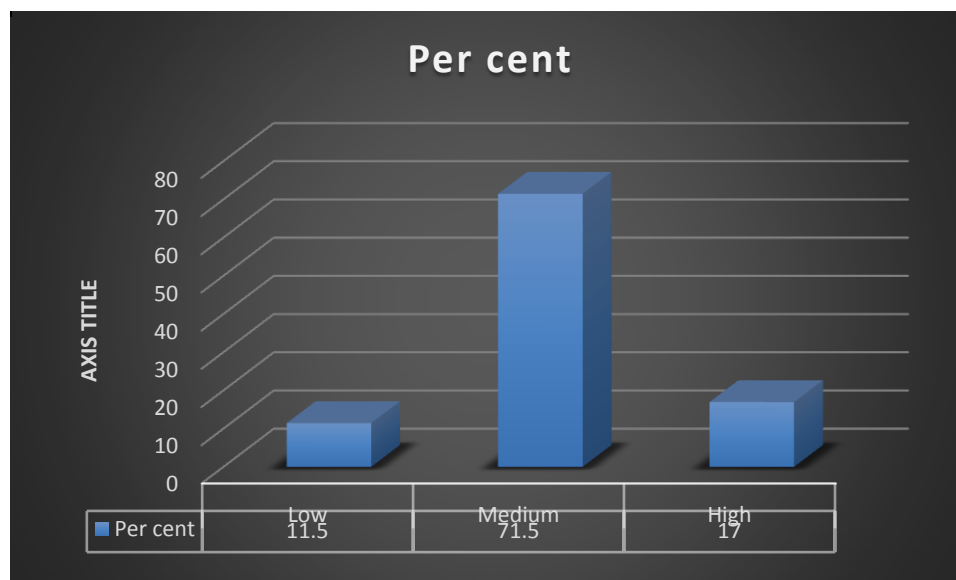


Figure 4.6 overall awareness level on climate change

The majority of respondents had some agricultural experience, and those with greater experience also had more interaction with extension agency representatives, both of which might account for the respondents' average level of knowledge.

Table 4.7 The Respondents' Level of Knowledge About Climatic Issues

Particulars	Aware	Per cent	Not Aware	Per cent
Receipt of low rainfall	348	90.50	36	9.50
Uneven distribution of rainfall	342	89.00	42	11.00
Reduction in number of rainy days	332	86.50	52	13.50
Could not able to predict rainy days	305	79.50	79	20.50
Unseasonal precipitation	215	56.00	169	44.00
Variation in temperature	267	69.50	117	30.50
Variation in wind speed and direction	171	44.50	213	55.50
Variation in relative humidity	198	51.50	186	48.50
Heavy summer	230	60.00	154	40.00
Heavy winter	196	51.00	188	49.00
Acid rain	132	34.50	254	65.50
Increasing heat and cold waves	184	48.00	200	52.00

From the data shown in Table 4.7, it is clear that over 80% of respondents are aware of the problems with low rainfall (90.5%), inconsistent rainfall (89%), and fewer rainy days (86.5%). The lowest levels of awareness were seen for acid rain (34.50%), changes in wind speed and direction (44.50%), and the occurrence of extreme heat and cold (48.00%).

5. CONCLUSION

One of the most pressing problems of our day is climate change. One industry particularly vulnerable to climate change is agriculture, which relies on factors such as precipitation and temperature. Temperature increases, severe weather events including droughts that lead to water shortages, a rapid rise in sea levels, increased evapotranspiration, crop loss, and a shifting ecology of agricultural pests and diseases are all signs that the climate is changing. These immediate effects have knock-on effects, such as lower food and livelihood security and climate change forecasts. Risks to people's livelihoods, such as market collapses and weakened institutional structures, will also result from these effects. Several climate change consequences exist, and it's important to learn about them all so that we may devise effective plans to lessen their negative effects.

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