DUM DUM MOTIJHEEL COLLEGE

DEPARTMENT OF Geography

B.Sc. Geography (Hons) CBCS Syllabus

Issued by the West Bengal State University

With effect from 2018-19

Programme Specific Outcomes

Upon successful completion of the undergraduate program in Geography, students will have:

- Developed a comprehensive and systematic understanding of the various theoretical and practical concepts across the breadth of geographical study.
- Gained the ability to critically evaluate geographical phenomena across spatial and temporal dimensions, from global to local levels.
- Acquired skills to prepare and interpret diverse cartographic materials to represent geographical patterns, processes, and relationships.
- Obtained knowledge of statistical and geospatial techniques for geographic analysis, enabling application in various fields.
- Through rigorous training in geographical research methodologies including field work, gained the ability to conduct studies extracting realities at the ground level and prepare scholarly project reports.
- Overall, been equipped to apply their acquired geographic knowledge and skills in various professional spheres.

DUM DUM MOTIJHEEL COLLEGE
Course Outcome: or Learning Outcome
Three year B.A. /B.Sc. degree course
Under CBCS Semester System
HONOURS COURSE IN GEOGRAPHY
With effect from the session: 2018 – 2019

Course Name: Core Course-1
Course Code: GEOACOR01T & GEOACOR01P
Topic Name: Geotectonics and Geomorphology

Course Outcome:

In this foundational course, students will:

- Learn about geological timescales, interior earth structure, isostasy, plate tectonics, rocks and minerals, weathering, mass wasting, fluvial processes, and coastal, glacial, and arid geomorphology.
- Comprehend concepts underlying the Earth's surface landscapes and processes.
- Emphasize interpretation of geological maps, cross-sections, and landscape evolution models.
- Gain a thorough grounding in the forces and factors shaping the Earth's diverse landforms.
- Understand the geological foundations underlying the Earth's surface.
- Comprehend mass wasting, fluvial, coastal, glacial, and arid geomorphological processes.
- Learn about rocks, minerals, weathering, and geologic timescales.
- Emphasize map and model interpretation to understand landform evolution.
- Gain foundational knowledge of the Earth's geomorphology and surface processes.

Course Name: Core Course-2
Course Code: GEOACOR02T & GEOACOR02P
Topic Name: Cartography and Thematic Mapping

Course Outcome:

In this course, students will:

- Learn fundamental principles of cartography including map properties, coordinate systems, projections, and cartographic techniques.
- Develop skills to construct diverse map types including comparative, diagonal and vernier scales, as well as choropleth, dot, and flow maps.
- Learn to interpret Survey of India topographical sheets and conduct terrain analysis.
- Develop technical skills for cartographic visualization and representation of geographical data and phenomena.
- Gain knowledge about coordinate systems and map projections.
- Learn techniques to construct different types of thematic maps.
- Acquire skills in cartographic principles and map-making fundamentals.
- Cover concepts of map properties, scales, and coordinate systems.
- Gain fundamental cartography knowledge to visualize and represent geographical data.

Course Name: Core Course-3
Course Code: GEOACOR03T
Topic Name: Human Geography

Course Outcome:

In this course, students will:

- Examine the spatial distribution and growth of human populations, settlements, cultures, economic activities, and their interactions with the environment.
- Comprehend theories and models explaining population distribution patterns, cultural diffusion, urbanization, agricultural land use, industrialization, and resource utilization.
- Analyze the anthropological aspects of human-environment relationships across scales from tribal communities to complex modern societies.
- Study the distribution and growth of human populations and activities.
- Learn about models of population patterns, cultural diffusion, urbanization, land use, and resource utilization.
- Examine human-environment interactions across societies.
- Cover concepts of population geography, settlement patterns, and economic geography.
- Gain understanding of the spatial aspects of human organization and environmental relationships.

Course Name: Core Course-4
Course Code: GEOACOR04T & GEOACOR04P
Topic Name: Cartographic Techniques

Course Outcome:

In this course, students will:

- Develop skills in cartographic data representation, collection and analysis through practical exercises.
- Learn to draw various thematic maps, carry out compass traversing, and conduct profile leveling surveys to capture field data.
- Gain hands-on experiences in basic field mapping and survey techniques.
- Acquire foundations for advanced data analysis using GIS software.
- Practice skills in cartographic data visualization and representation.
- Use compass traversing and leveling surveys to collect spatial data in the field.
- Learn basic field mapping and spatial data gathering techniques.
- Gain practical experience in geographical data collection and field surveys.
- Develop proficiency in fundamental cartographic and field research skills.

Course Name: Core Course-5
Course Code: GEOACOR05T & GEOACOR05P
Topic Name: Climatology

Course Outcome:

In this course, students will:

- Gain a comprehensive understanding of atmospheric processes influencing weather and climate.
- Analyze interactions between the atmosphere and earth surface across scales from local to global.
- Learn weather map interpretation, climograph and hythergraph construction, and climatic classification systems.
- Comprehend the dynamics of general atmospheric circulation, jet streams, airmass boundaries and disturbances producing cyclones.
- Address issues of contemporary climatic changes including global warming.
- Study atmospheric processes and their influence on weather and climate.
- Learn techniques like weather map reading and climograph construction.
- Analyze interactions between the atmosphere and earth's surface.
- Cover atmospheric circulation patterns and cyclone formation.
- Examine contemporary climate change issues such as global warming.

Course Name: Core Course-6
Course Code: GEOACOR06T
Topic Name: Geography of India

Course Outcome:

In this course, students will:

- Gain an integrated understanding of the physical and human geography of the Indian subcontinent.
- Do detailed regional analysis examining the terrain, natural resources, climate, population dynamics, tribal communities, agricultural systems, industries, transport patterns, urban settlements, and developmental disparities across India.

- Specifically analyze the physical and human landscapes of West Bengal.
- Study the geography, both physical and human, of India and West Bengal.
- Examine terrain, climate, resources, population, tribes, agriculture, industry, transportation, settlements, and development across Indian regions.
- Learn about the regional geography of India, including detailed analysis of West Bengal.
- Integrate knowledge on the physical and human geography of the subcontinent.
- Analyze geographic variations across India in climate, land use, population, transportation, industry, and development.
- Understand the diverse regional geography within the country.

Course Name: Core Course-7
Course Code: GEOACOR07T & GEOACOR07P
Topic Name: Statistical Methods in Geography

Course Outcome:

In this course, students will:

- Learn foundational statistical skills and concepts to scientifically analyze quantitative geographical data.
- Study diverse data types, sampling methods, frequency distributions, central tendencies, dispersions, correlations, regressions, time series, and more.
- Gain hands-on exercises in statistical techniques for testing spatial patterns and models.
- Develop expertise in data matrix construction, interpretation and visualization using statistical software.
- Acquire foundational statistical skills for geographical data analysis.
- Study quantitative data types, sampling, distributions, correlations and regressions.
- Practice statistical techniques for spatial analysis through hands-on exercises.
- Build skills in geographical data matrices, interpretation, and visualization.
- Learn key statistical methods and concepts for geography and spatial analysis.

Course Name: Core Course-8
Course Code: GEOACOR08T
Topic Name: Regional Planning and Development

Course Outcome:

In this course, students will:

- Examine theoretical models and practical methods for regional development planning.
- Analyze regional delineation, growth disparities, and development indicators to formulate balanced planning for underdeveloped areas.
- Cover sustainable resource utilization, environmental conservation, infrastructure provision, poverty alleviation and grassroots participatory approaches within comprehensive regional plans.
- Use case studies to understand regional planning in the Indian context.
- Learn about models and methods for regional development planning.
- Analyze regional delineation, disparities, and indicators for balanced planning.
- Examine sustainable resource use, conservation, infrastructure, poverty alleviation, and participation in regional plans.
- Study Indian case studies to understand regional planning approaches.
- Gain knowledge on theoretical and practical regional planning.

Course Name: Core Course-9
Course Code: GEOACOR09T
Topic Name: Economic Geography

Course Outcome:

In this course, students will:

- Learn theoretical foundations and contemporary applications of economic geography.
- Analyze location factors, transportation networks, spatial interaction models, trade patterns, and geographic industry concentrations.
- Cover concepts like economic space, comparative advantage, economies of scale, and technological diffusion.
- Examine globalization, outsourcing, multinational networks, and related impacts.

- Study foundations and applications of economic geography.
- Analyze location factors, transportation, trade patterns, and industry geography.
- Learn about economic space, comparative advantage, economies of scale, and diffusion.
- Examine globalization, outsourcing, multinationals, and impacts.
- Gain knowledge on theoretical and applied economic geography.

Course Name: Core Course-10
Course Code: GEOACOR10T & GEOACOR10P
Topic Name: Environmental Geography

Course Outcome:

In this course, students will:

- Be introduced to the nature and scope of environmental geography and contemporary ecological issues.
- Learn concepts of ecosystems, food chains, nutrient cycling, carrying capacity, and sustainability to examine environmental problems.
- Comprehend issues like pollution, waste, deforestation, biodiversity losses and soil degradation.
- Understand global environmental policies, resource ethics, EIA procedures, and local perceptions.
- Do practical exercises in questionnaire surveys, impact assessment, and data analysis for environmental planning.
- Get an introduction to environmental geography and ecology.
- Learn about ecosystems, sustainability, and examining ecological issues.
- Comprehend environmental problems like pollution, deforestation, and biodiversity loss.
- Study environmental policies, ethics, impact assessment, and perceptions.
- Gain practical training in surveys, impact assessment, and environmental data analysis.

Course Name: Core Course-11
Course Code: GEOACOR11T & GEOACOR11P
Topic Name: Field Work and Research Methodology

Course Outcome:

In this course, students will:

- Get hands-on training in geographical field data collection and research techniques.
- Gain practical experience in reconnoitering landscapes, observing physical and human features, conducting surveys using questionnaires and interviews, mapping land use patterns, and compiling secondary data.
- Learn field ethics, safety, teamwork, and the use of GPS, surveying instruments, photography, data recording formats, and field notebooks.
- Prepare integrated field reports incorporating maps, data tables, photographs, and results of statistical analysis.
- Receive practical training in geographical field research and data collection.
- Get experience in landscape observation, surveys, mapping, and secondary data compilation.
- Learn about field ethics, safety, teamwork, and using GPS, instruments, photography, and notebooks.
- Prepare integrated field reports with maps, tables, photos, and analysis.
- Develop hands-on skills in geographical fieldwork, surveying, and report preparation.

Course Name: Core Course-12
Course Code: GEOACOR12T & GEOACOR12P
Topic Name: Remote Sensing and GIS

Course Outcome:

- Develop technical skills in geospatial data analysis methods including satellite image processing, GIS, and Remote Sensing through practical exercises using industry-standard software.
- Learn image rectification, enhancement, classification, and interpretation for feature identification and thematic mapping.
- Cover spatial data generation, management, overlay analysis and output generation using GIS and case study datasets.
- Integrate remote sensing with GIS for sophisticated geographic analysis and modeling applications.
- Gain practical skills in satellite image processing, GIS, and remote sensing software.
- Study image rectification, enhancement, classification, and interpretation.
- Use GIS for spatial data handling, analysis, and mapping with case studies.

- Integrate GIS and remote sensing for advanced analysis and modeling.
- Acquire technical expertise in geospatial data analysis using industry-standard GIS and remote sensing software.

Course Name: Core Course-13
Course Code: GEOACOR13T
Topic Name: Evolution of Geographical Thought

Course Outcome:

In this course, students will:

- Trace the history of geographical and environmental ideas from ancient to modern times.
- Comprehend the contributions of influential geographers, cartographers, explorers, scholars, and schools of thought across the centuries.
- Emphasize developments in philosophical paradigms, human-environment perspectives, and interlinkages between geography and sister disciplines.
- Develop a holistic understanding of the evolution of geographical knowledge and its applications for human society.
- Learn the history of geography and environmental ideas from ancient to modern times.
- Study influential geographers, cartographers, explorers, scholars, and schools of thought.
- Examine developments in paradigms, human-environment perspectives, and interdisciplinary linkages.
- Gain a holistic understanding of the evolution of geographical knowledge and its applications.
- Cover the chronological history of geographic and environmental thought.
- Analyze key contributions to the field across different eras.

Course Name: Core Course-14
Course Code: GEOACOR14T & GEOACOR14P
Topic Name: Disaster Management

Course Outcome:

In this course, students will:

- Develop a comprehensive understanding of approaches to natural and human-induced disaster analysis and mitigation.
- Examine geophysical hazards, vulnerability models, disaster prevention, preparedness, rehabilitation and reconstruction across scales from local to international.
- Prepare case studies and disaster management plans for at-risk regions incorporating risk communication, early warning systems, emergency response, refugee relief strategies and community participation.
- Gain knowledge on disaster analysis and mitigation approaches.
- Study hazards, vulnerabilities, prevention, preparedness, rehabilitation, and reconstruction.
- Prepare disaster case studies and management plans incorporating communication, warnings, response, relief, and participation.
- Learn comprehensive approaches for natural and human-induced disaster mitigation.
- Examine vulnerabilities, preparedness, rehabilitation, and community-level capacity building.
- Develop skills in disaster analysis, planning, and risk reduction.

Course Name: Discipline Specific Elective-1
Course Code: GEOADSE01T
Topic Name: Soil and Bio Geography

Course Outcome:

- Understand the fundamental concepts of soil science, including soil formation, classification, and properties.
- Analyze the role of soil in supporting plant life and ecosystems.
- Evaluate the impact of human activities on soil quality and fertility.
- Demonstrate knowledge of various soil types and their geographical distribution.
- Explore the relationship between soil characteristics and vegetation patterns.
- Examine the influence of climate, topography, and parent material on soil development.
- Discuss the role of microorganisms in soil ecosystems and their contribution to nutrient cycling.
- Identify key soil conservation techniques and sustainable land management practices.
- Assess the significance of soil in global biogeochemical cycles.
- Apply geographical principles to analyze spatial patterns of soil distribution and its implications for biodiversity.
- Critically evaluate case studies and research related to soil and bio-geography.

- Develop practical skills in soil sampling, analysis, and interpretation.
- Gain an appreciation for the interdisciplinary nature of soil and bio-geography and its relevance to environmental science and agriculture.

Course Name: Discipline Specific Elective-2
Course Code: GEOADSE02T
Topic Name: Settlement Geography

Course Outcome:

- Understand the basic concepts and principles of settlement geography.
- Analyze the spatial patterns and distribution of human settlements.
- Examine the factors influencing the location and growth of settlements.
- Evaluate the impact of physical, social, economic, and cultural factors on settlement patterns.
- Explore the historical development and evolution of settlements.
- Identify different types of settlements, such as rural, urban, and peri-urban, and their characteristics.
- Discuss the role of transportation, infrastructure, and land use planning in shaping settlements.
- Examine the challenges and opportunities associated with rural and urban settlements.
- Analyze the socio-economic and demographic characteristics of various settlements.
- Investigate the role of technology in influencing settlement patterns and dynamics.
- Apply spatial analysis techniques to study settlement morphology and patterns.
- Explore the relationship between settlements and the environment, including issues related to sustainability and resilience.
- Develop critical thinking skills through the analysis of case studies and real-world examples in settlement geography.
- Gain practical knowledge in settlement planning and management.
- Understand the global context of settlement geography and its implications for regional and urban development.

Course Name: Discipline Specific Elective-3
Course Code: GEOADSE04T
Topic Name: Hydrology and Oceanography

Course Outcome:

- Understand the fundamental principles and concepts of hydrology and oceanography.
- Examine the water cycle and its components, including precipitation, evaporation, and runoff.
- Analyze the physical properties of water and their influence on hydrological and oceanographic processes.
- Evaluate the impact of human activities on water resources and ocean ecosystems.
- Explore the distribution and movement of water in rivers, lakes, oceans, and other water bodies.
- Investigate the role of climate in shaping hydrological and oceanographic patterns.
- Examine the interaction between oceans and the atmosphere, including ocean currents and atmospheric circulation.
- Identify the characteristics of coastal zones and their vulnerability to natural hazards.
- Understand the principles of oceanography, including marine biology, chemistry, and geology.
- Analyze the role of oceans in global climate regulation and the carbon cycle.
- Explore the impact of climate change on hydrological cycles and ocean dynamics.
- Discuss water management strategies and their implications for sustainable development.
- Apply quantitative methods and tools for analyzing hydrological and oceanographic data.
- Develop an understanding of the interdisciplinary nature of hydrology and oceanography and its relevance to environmental science.
- Gain practical skills in conducting field studies and laboratory analyses related to hydrology and oceanography.

Course Name: Discipline Specific Elective-4
Course Code: GEOADSE06T
Topic Name: Resource Geography

Course Outcome:

- Understand the fundamental concepts and principles of resource geography.
- Identify and classify various natural resources, including renewable and non-renewable resources.
- Analyze the spatial distribution of natural resources on a global, regional, and local scale.
- Examine the factors influencing the exploitation and utilization of resources.
- Evaluate the environmental, economic, and social impacts of resource extraction and management.

- Explore the role of technology in resource exploration, extraction, and processing.
- Investigate the geopolitical issues related to the distribution and control of natural resources.
- Discuss sustainable resource management practices and their implications for future generations.
- Analyze the role of government policies and international agreements in resource governance.
- Understand the concept of resource scarcity and its implications for global development.
- Explore the interdisciplinary nature of resource geography, incorporating aspects of geology, economics, and environmental science.
- Develop analytical and critical thinking skills through case studies and real-world examples in resource geography.
- Identify and assess alternative and renewable sources of energy.
- Gain practical knowledge in conducting resource assessments and environmental impact assessments.
- Apply geographic information systems (GIS) and remote sensing techniques for resource mapping and analysis.

Course Name: Skill Enhancement Course 1
Course Code: GEOSSEC01M
Topic Name: Remote Sensing

Course Outcome:

- Understand the fundamental principles and concepts of remote sensing.
- Identify the various platforms used in remote sensing, such as satellites, aerial platforms, and unmanned aerial vehicles (UAVs).
- Learn the electromagnetic spectrum and its relevance to remote sensing applications.
- Develop proficiency in interpreting and analyzing remotely sensed images and data.
- Explore the applications of remote sensing in different fields, including agriculture, forestry, geology, environmental science, and urban planning.
- Acquire knowledge of different types of sensors used in remote sensing and their specific applications.
- Understand the process of image acquisition, including sensor calibration and geometric correction.
- Analyze the role of geographic information systems (GIS) in conjunction with remote sensing data.
- Examine the use of remote sensing in monitoring and managing natural resources.
- Explore the applications of remote sensing in disaster management and response.
- Gain practical skills in image interpretation, classification, and digital image processing.
- Understand the ethical and societal implications of remote sensing technologies.
- Evaluate the limitations and challenges associated with remote sensing data, including atmospheric effects and resolution issues.
- Develop the ability to design and implement remote sensing projects for specific applications.

Course Name: Skill Enhancement Course 2
Course Code: GEOSSEC02M
Topic Name: Spatial Statistical Techniques

Course Outcome:

- Develop a foundational understanding of spatial statistical techniques.
- Acquire knowledge of basic statistical concepts and methods relevant to spatial data analysis.
- Understand the principles of spatial autocorrelation and its applications in spatial statistics.
- Learn different spatial data models and their implications for statistical analysis.
- Gain proficiency in the application of exploratory spatial data analysis (ESDA) techniques.
- Develop skills in spatial interpolation methods for estimating values at unobserved locations.
- Explore the use of geostatistical techniques for modeling spatial variability and uncertainty.
- Understand the principles of spatial regression analysis and its applications in modeling spatial relationships.
- Learn about cluster analysis techniques for identifying spatial patterns and hotspots.
- Explore the integration of Geographic Information Systems (GIS) with spatial statistical techniques.
- Analyze real-world spatial datasets using appropriate statistical software.
- Develop the ability to interpret and communicate results of spatial statistical analyses.
- Understand the ethical considerations and limitations associated with spatial statistical techniques.
- Apply spatial statistical methods to solve practical problems in various fields, including environmental science, epidemiology, and urban planning.

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GENERAL COURSE IN GEOGRAPHY
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Course Name: Generic Elective/Core Course 1
Course Code: GEOHGEC01T / GEOGCOR01T
Topic Name: Physical Geography

Course Outcome:

- Systematic understanding of major physical geographic systems and processes.
- Comprehension of Earth's internal structure and plate tectonics.
- Recognition of different rock types and understanding fluvial processes.
- Exploration of erosion cycles and climatic phenomena.
- Study of atmospheric circulation and hydrologic cycling.
- Analysis of ocean systems and their role in shaping landscapes.
- Examination of interactions between lithosphere, atmosphere, hydrosphere, and biosphere.
- Integration of perspectives on environmental processes across spatial scales.
- Development of foundational knowledge in physical geography.
- Building a basis for further study in the field.

Course Name: Generic Elective/Core Course 2
Course Code: GEOHGEC02T / GEOGCOR02T
Topic Name: Human Geography

Course Outcome:

- Examination of spatial organization, growth, and mobility of human populations.
- Analysis of distribution patterns, migration processes, and cultural diffusion.
- Exploration of ethnicity, economic interdependencies, and urbanization.
- Study of resource utilization, agricultural land use, and developmental disparities.
- Focus on local to global scales to understand varying human landscapes.
- Utilization of case studies to illustrate the impact of demographic, social, political, and environmental factors.
- Development of conceptual perspectives on human-environment relationships.
- Exploration of sustainability in the context of human populations and their interactions with environments.

Course Name: Generic Elective/Core Course 3
Course Code: GEOHGEC03T / GEOGCOR03T
Topic Name: General Cartography

Course Outcome:

- Imparting fundamental knowledge about principles, concepts, techniques, and applications of cartography.
- Learning about map properties, coordinate systems, projections, scales, and terrain representation.
- Exploration of thematic mapping and its applications.
- Practical exercises to develop skills in map reading, interpretation, analysis, and generation.
- Utilization of both manual and digital techniques in cartography.

- Providing foundations in cartographic principles to enhance visual thinking.
- Building connections between spatial phenomena and their graphic representations.
- Development of abilities that serve as groundwork for advanced mapping and geospatial analysis.

Course Name: Generic Elective/Core Course 4
Course Code: GEOHGEC04T / GEOGCOR04T
Topic Name: Environmental Geography

Course Outcome:

- Introduction to the field of environmental geography and sustainability issues.
- Key concepts include environmental components, ecosystem services, and food chains.
- Exploration of biodiversity, natural cycles, carrying capacity, hazards, and resilience.
- Study of conservation ethics and policies in the context of environmental geography.
- Utilization of case studies to understand human impacts on the environment.
- Examination of resource overuse, pollution, land degradation, habitat destruction, and global climate change.
- Emphasis on integrative approaches that balance environmental conservation with human development needs.
- Providing students with a comprehensive understanding of environmental challenges and potential solutions.

Course Name: Department Specific Elective 1
Course Code: GEOGDSE01T
Topic Name: Soil and Biogeography

Course Outcome:

- Analysis of fundamental concepts in soil geography and biological distributions.
- Soil component covers pedogenic processes, physical/chemical properties, soil morphology, and productivity potentials.
- Exploration of soil degradation through erosion and desertification.
- Study of major soil classification systems.
- Biogeography segment examines ecosystems from energy flow and nutrient cycling perspectives.
- Focus on communities and ecological successions in biogeography.
- Learning about biodiversity patterns and environmental tolerances.
- Understanding biotic-abiotic interactions governing assemblages from local niches to global biomes.
- Comprehensive coverage of soil and biogeography concepts in the course.

Course Name: Department Specific Elective 2
Course Code: GEOGDSE04P
Topic Name: Project Report Based on Field Work

Course Outcome:

- Practical training in geographical field data collection and research methodologies.
- First-hand experience in landscape survey techniques.
- Primary data gathering through questionnaires and interviews.
- Mapping land use patterns and compiling secondary data.
- Integration of multifaceted data into cogent reports.
- Enhancement of abilities in geographical observation and spatial analysis.
- Emphasis on teamwork, ethics, analytical skills, and communication.
- Fieldwork promotes direct experience of human-environment interactions.
- Imprinting lasting lessons about geographical realities through hands-on learning.

Course Name: Ability Enhancement Compulsory Course
Course Code: ENVSAEC01T
Topic Name: Environmental Studies

Course Outcome:

- Holistic understanding of environmental issues and sustainable development.
- Exploration of natural resources, ecological principles, biodiversity, pollution, and waste generation.
- Examination of resource depletion and climate change linkages.
- Focus on the interconnectedness between environment, economy, and society.
- Case studies to promote analytical thinking on local and global environmental problems.
- Emphasis on identifying solution pathways for environmental challenges.
- Development of interdisciplinary perspectives to achieve harmony between human needs and environmental sustainability.
- Comprehensive coverage of the relationships between humans and the environment.