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A World Bibliography

Compiled and Edited by

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for

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Pre-Conference Meeting of the IGU Working Group on Desertification
Desert Research Institute, Ashkhabad, Turkmen SSR

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University of Arizona
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ADDITIONAL PUBLICATIONS ON ARID LANDS

Office of Arid Lands Studies:

Seventy-Five Years of Arid Lands Research at the University of Arizona, A Selective Bibliography, 1891-1965

Arid Lands Abstracts, no. 3 (1972)-no. 8 (1976)

Jojoba and Its Uses, An International Conference, 1972

Arid Lands Resource Information Papers, no. 1 (1972)-no. 9 (1976)

An International Conference on the Utilization of Guayule, 1975

Arid Lands Newsletter, no. 1 (1975)-to date

University of Arizona Press (*=OALS authors):

*Deserts of the World

*Arid Lands in Perspective

*Food, Fiber and the Arid Lands

Coastal Deserts, Their Natural and Human Environments

Polar Deserts and Modern Man

*Arid Lands Research Institutions: A World Directory

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ACKNOWLEDGMENTS

As Editor, my greatest obligation in the preparation of this bibliography for publication is to Mrs. Jean Mills, Research Assistant, Office of Arid Lands Studies, who virtually lived for five months in the University of Arizona Libraries verifying information submitted by the several regional contributors, and then barricaded herself in her office while she reconciled a variety of styles to the format of our computer program that stores and retrieves from the data base comprising the Arid Lands Information System (ALIS).

The technical staff — Lynn Lybeck, Systems Analyst, Julie V. Garrettson in charge of terminal operations, and Eleanor Smith who assisted her with data entry — produced the document you hold in your hands, all of them sharing the often tedious work of modifying the computer program where necessary, entering the information on the terminal, reading proof three times, and doing the preliminary preparation of printouts for the photoreduction and photoreproduction that enabled us to compress these hundreds of citations into manageable size. My deepest thanks to all, not least for the interest they took in the project and in the subject as well. I hope each thinks of himself as a minor authority on desertification.

The backup support of the University of Arizona, and particularly that of the Office of Arid Lands Studies, is greatly appreciated. Our Director, Dr. Jack D. Johnson, stabilized the disruptions to the Office, inevitable in a project of this magnitude, by his enthusiastic cooperation. Mary Michael, Information Specialist, and Helen Kassander, Research Assistant, helped us meet our deadline by relinquishing their share of the technical staff's time over a period of months.

I am grateful to my colleague, Dr. Andrew W. Wilson, University of Arizona Department of Geography, Regional Development, and Urban Planning, and Vice-Chairman of the IGU Working Group on Desertification, for his counsel and advice during the year we worked on the bibliography, and to Professor Jack W. Mabbutt, Chairman, Department of Geography, University of New South Wales, Kensington, and Chairman of the IGU Working Group, for his willingness to allow me to go forward on the project in my own way. His keen eye and impeccable judgment sharpened my own approach to the undertaking.

To the collaborators throughout the arid world, as noted elsewhere herein, those recognized authorities on the regions represented by their citation contributions, who responded bravely to all my anguished cables to hurry, hurry, my very best thanks. The bibliography is really theirs, expressing as it does their understanding of particular environments and the impact of desertification thereon.

-Patricia Paylore

Tucson

July 4, 1976

EDITOR'S PREFACE

This bibliography is a selection of largely recent information on worldwide desertification, a greatly expanded listing from that which accompanied a paper on the subject first published by the University of Arizona's Office of Arid Lands Studies in 1973*. It has been compiled and edited for the 23rd International Geographical Congress, Moscow, 1976, more particularly for the Pre-Conference Meeting of the IGU Working Group on Desertification in Ashkhabad, July 1976, since it was under its aegis that the task was undertaken in the summer of 1975.

The Working Group came into being at the IGU's Montreal Congress, 1972, as a successor to the former Commission on the Geography of Arid Lands. Its stated aim was "to collect evidence on the nature and causes of environmental changes constituting an extension of deserts into marginal areas or an intensification of desert conditions within arid regions." Two subsequent field meetings of the Working Group were held: in Alice Springs in the early winter of 1974; and in Cambridge, England, in the early fall of 1975. When the Editor was co-opted to the Working Group, it was agreed that she would depend to a large degree on contributions from various regional collaborators for coverage of specific areas. Those persons are listed here, many of whom are also authors of the brief introductory remarks which precede most sections of the bibliography itself:

Worldwide:	Ronald F. Peel, University of Bristol
Saharan Region and Sahel:	A. T. Grove, Cambridge University (English)
	Monique Mainguet, Reims University (French)
	Horst Mensching, University of Hamburg)
	F. N. Ibrahim, University of Hamburg) (German)
	Wolfgang Meckelein, University of Stuttgart)
East Africa:	Leonard Berry, Clark University, Worcester
Southern Africa:	Peter D. Tyson, University of Witwatersrand
Middle East:	Peter Beaumont, University of Durham
USSR:	Michael Petrov, Leningrad University
Pakistan:	Mushtaqur Rahman, Iowa State University
India:	H. S. Mann, Central Arid Zone Research Institute, Jodhpur
Australia:	J. A. Mabbutt, University of New South Wales
South America:	Hans J. Schneider, University of New South Wales
North America:	Andrew W. Wilson, University of Arizona

Many of the Regional Organizers have been assisted by local correspondents, who are in effect Corresponding Members of the Working Group.

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* Sherbrooke, W. C. / Paylore, P. (1973) World Desertification: Cause and Effect. A Literature Review and Annotated Bibliography. University of Arizona, Office of Arid Lands Studies, Arid Lands Resource Information Paper 3. 168 p.

The following framework was suggested to the regional contributors early in the project, as a guide to selection of references. While not all items are represented in each gathering, the presence of citations dealing with any of these concepts can be determined from the index for each region.

A. Natural Trends:

1. Climatic changes in the historical period
2. Hydrologic changes
3. Changes in landforms due to the action of water
4. Changes in landforms due to the action of wind
5. Changes in soils
6. Changes in natural vegetation

B. Man's Influence on the Processes of Desertification:

1. Agriculture, dryland or irrigated
2. Pastoralism, rural settlement, and nomadism
3. Forestry, with emphasis on collection of fuel
4. Urbanization
5. Population changes
6. Mining (including oil and gas) and pipeline construction
7. Transportation, including construction of roads, railways, airfields
8. Tourism and recreation

C. Preservational Measures:

1. Studies of status and trend of the environment
2. Regional assessments of natural resources
3. Studies of natural hazards
4. Establishment of natural parks and reserves
5. Other controls of land use

D. Preventive and Remedial Measures:

1. Climate: climatic stress, rainmaking, evaporation suppression, shelterbelts
2. Water supplies: inventories of water resources, water balance or hydrologic cycle, improvement of supplies for drinking, stock or irrigation; water harvesting schemes
3. Erosion control: stabilization of dunes and drift sands, monitoring of processes, measures against water and wind erosion
4. Improvement of desert vegetative cover: surveys of the extent of degradation, range and grazing studies, revegetation of bare areas, pasture improvement, afforestation
5. Control of land use: pastoral, dryland / irrigated agriculture
6. Control of population and settlement: nomads, rural settlement, urban planning, communications
7. Development of alternative resources: regional development, mining, industry tourism, recreation, health care

It was also suggested that we attempt to keep within a timeframe of the past decade. This was done to a large extent, but earlier papers of a classic nature are still included where it is generally agreed that their presentation has not been improved upon.

Because of the massive infusion of bibliographic information, which (even with what, at times, must have appeared to be brutal editorial cuts) still far exceeds the total number of references envisaged when we began, we have had to be arbitrary in the manner in which we have handled some of the information. Where we have departed radically from the format employed to display the greatest percentage of information, such as the USSR, we have appended an explanation following the regional contributor's Introduction. We have included several hundred documents from our own Arid Lands Information System (ALIS) to enhance the coverage submitted by our regional colleagues.

Much work was done at Arizona to bring these hundreds of references into the format required by our computer program. Many references were dropped because of lack of adequate information to identify and locate copies should users so require. For those without the services of skilled documentalists and/or bibliographers to call upon, it has always seemed to us that our meticulous and sometimes fussy insistence on full bibliographical information is the sine qua non of good bibliography. In this respect, while much of the documentation in this bibliography was very difficult indeed, we believe that the smallest percentage humanly possible is included that has not been verified by our staff. We trust, therefore, that because of this care, users will find the full documentation more readily accessible than they would otherwise.

Indexing (except for the USSR) was done from the Thesaurus of Arid Lands Terminology (c1974), developed and used by the Office of Arid Lands Studies for its computerized data bank; and to make the use of the bibliography less cumbersome, subject keywords and authors appear as computerized lists following each section. The documentation from the USSR was sorted out into ten overall categories, and no indexing of individual citations was undertaken.

An effort was made to eliminate all references that did not contribute to an understanding of the phenomenon of desertification itself, rather than to permit the bibliography to become a general arid lands compilation. That we did not always succeed must be attributed not only to our inability to distinguish at times, but also to the disagreements and confusion existing among desert experts as to exactly what constitutes desertification. For those users who miss their favorite citations - their own or others - we ask you to take this constraint into account.

The Editor takes full responsibility for the choice of references carried, and for all shortcomings of coverage or format. I hope the latter will be outweighed by the work's overall usefulness at this critical time in the world's understanding of a biological and physical process that is affecting the lives of millions.

DESERTIFICATION — WORLDWIDE

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DESERTIFICATION - WORLDWIDE

The problem of desertification is recurrent and worldwide, with visible evidence of its ravages in Jordan, the Rajasthan, the Sahara, northeastern Brazil, and elsewhere. Its causes are several, and when combined, as they are now being in this last quarter of the twentieth century, their cumulative effect can set in train a biological process that may bring us face-to-face with that "threshold of damage, from whatever cause, beyond which irreversibility sets in."

Long-term (in the geologic sense) climatic change and the destructive consequences of man's activities are exacerbated by climatic fluctuation — short-term weather patterns induced by uncertain rainfall and followed by cyclic droughts from which marginal areas may not recover if subjected to continued attempts at intensive use that cannot be sustained by a dry year or a succession of dry years. Climatic change, long- or short-term, can initiate hydrologic changes, changes in landforms; changes in soils by wind and water erosion, salinity, decline in fertility or structural changes; and changes in natural vegetation, either in structure and composition, or by death or failure to regenerate. Biotic adaptation to climatic variability is such that arid ecosystems are usually not in equilibrium with the climate during times of such variations. Increases of vegetation and population during times of climatic amelioration means that the ecosystem is thus more susceptible to degradation during times of climatic deterioration.

Included in the wide-ranging catechism of man's environmentally destructive practices we must cite the full spectrum of his activities worldwide: overgrazing, both dryland and irrigated agriculture, slash-and-burn, population changes, tourism, pastoralism, nomadism, ill-conceived development schemes, marginal cash crops, intensive technology without socio-cultural backup, etc., etc., ad infinitum.

While reports from the Sahel illustrate more dramatically than the scientific literature the urgency of an international attack on the problems generated by desertification, the scientific literature nevertheless does tell the same story, though in a "drier" way, perhaps. To deal with problems of such grave import, now so apparent that they can no longer be ignored, governments are being urged to alleviate the social and economic problems resulting from altered conditions of productivity in the arid zones, since those areas suffering their greatest deterioration are the very ones most in need of their maximum productive capacity to sustain the inexorable rise in population.

Neverthless, mounting pressure for optimal utilization and productivity of desert regions is likely to initiate practices that under the climatic patterns prevailing will result in further destruction of the natural resource base: vegetation and soils. Many of the following references express the hope that some balance can be achieved between the needs and desires of man and the ecological realities of the arid and semiarid regions of the world.

AMBE, Y.

1967

SECULAR VARIATION OF ARIDITY IN THE WORLD.

JAPANESE JOURNAL OF GEOLOGY AND GEOGRAPHY 38(1):43-61. MGA 19.2-319. GA 68B-500. SWRA W71-04288.

AN ATTEMPT IS MADE TO UNDERSTAND RECENT CLIMATIC VARIATIONS FROM THE STANDPOINT OF SPATIAL VARIATION OF ARID CLIMATIC REGIONS. SINCE VARIATIONS IN ARID CLIMATES SEEM TO REFLECT SECULAR VARIATIONS OF GENERAL CIRCULATION, IT IS IMPORTANT TO DETERMINE WHETHER RECENT WORLD CLIMATIC VARIATIONS TAKE PLACE ON A GLOBAL SCALE, ON A HEMISPHERIC UNIT OR ON A CONTINENTAL SCALE. MONTHLY ARIDITY IS DEFINED ON THE BASIS OF THE PRECIPITATION (P)/EVAPORATION (E) RATIO, WHICH CORRESPONDS TO THORNTHWAITE'S P-E RATIO. IF THE RATIO IS LESS THAN 1 FOR ANY MONTH, IT IS TERMED A DRY MONTH. AN ARID REGION IS DEFINED AS ANY REGION IN WHICH EVERY MONTH IS A DRY MONTH. USING PRECIPITATION AND TEMPERATURE DATA FROM A NUMBER OF YEARS OVER THE PAST HALF CENTURY, THE P-E RATIO WAS CALCULATED FOR EACH MONTH OF THE YEAR AND FOR ALL CONTINENTS EXCEPT THOSE LATITUDINAL REGIONS WHERE MEAN MONTHLY TEMPERATURES FELL BELOW -10 DEGREES CENTIGRADE. ALL ARID REGION BOUNDARIES WERE THEN DEFINED, AND THEIR VARIATION OVER TIME WAS DETERMINED. CLIMATIC CONDITIONS FORMING ARID REGIONS VARIED FROM YEAR TO YEAR, AND THE VARIATION WAS ALWAYS GREATER ON THE EAST SIDE THAN THE WEST. HOWEVER, IN THE PERIOD 1931-1960 NO REMARKABLE CHANGES WITH A DEFINITE TENDENCY WERE FOUND. FREQUENCY DISTRIBUTIONS HAD GENERALLY LARGE VARIANCES, INDICATING COMPLICATED ARID ZONE FORMATION FACTORS. IN YEARLY FLUCTUATIONS HEMISPHERIC SCALE VARIATIONS PREDOMINATED OVER THOSE ON A GLOBAL SCALE AND RELATIONSHIPS BETWEEN CLIMATIC VARIATIONS IN THE NORTHERN AND SOUTHERN HEMISPHERES WERE INSIGNIFICANT. THE LARGE VARIABILITY IN ARID REGION PATTERNS SHOWS THE CHARACTERISTICS OF CLIMATE ITSELF, REFLECTING CONDITIONS OF ATMOSPHERIC CIRCULATION.

OALS/ARIDITY/CLIMATIC CHANGE/ATMOSPHERIC CIRCULATION/ARID CLIMATE/SYNOPTIC CLIMATOLOGY/POTENTIAL EVAPOTRANSPIRATION/VARIABILITY(ENVIRONMENTAL)/TEMPERATURE RANGES

2

AMIRAN, D.H.K.

1963

EFFECTS OF CLIMATIC CHANGE IN AN ARID ENVIRONMENT ON LAND-USE PATTERNS.

UNESCO, PARIS. ARID ZONE RESEARCH 20:437-442.

CLIMATIC CHANGE/LAND USE/ARID LANDS/WATER SOURCES/DRY FARMING/NOMADS/ HUMAN BEHAVIOR/IRRIGATION EFFECTS/DEGENERATION

3

BIROT, P.

1968

THE CYCLE OF EROSION IN DIFFERENT CLIMATES.

UNIVERSITY OF CALIFORNIA PRESS, BERKELEY. 144 P. ANAG(1968)02598. MGA 20.7-14.

THE ORIGINAL TEXT (1960) HAS BEEN BROUGHT UP TO DATE FOR THIS TRANSLATION. COVERAGE INCLUDES WEATHERING OF ROCKS, TRANSPORT OF DEBRIS ON SLOPES, AND FLUVIAL DYNAMICS. IN CONSIDERING THE INFLUENCE OF DIFFERENT CLIMATES ON THE CYCLE OF EROSION, THE AUTHOR DISCUSSES FIVE CLIMATE TYPES INCLUDING ARID AND SEMI-ARID. (OALS)

CLIMATIC GEOMORPHOLOGY/GEOMORPHOLOGY/CYCLES-OF-EROSION CONCEPT/ WEATHERING/EROSION/FLUVIAL PROCESSES/OALS

4

BOYKO, H.

1951

ON REGENERATION PROBLEMS OF THE VEGETATION IN ARID ZONES.

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES, SER. B, COLLOQUIA 9:62-80.

DESCRIBES NEW METHODS FOR OBTAINING PLANT INDICATORS FOR DETERMINING CLIMATIC FACTORS.

REVEGETATION/PLANT INDICATORS/CLIMATIC ZONES/TECHNIQUES

5

BROWN, G.W., JR. ED.

1968 - 1974

DESERT BIOLOGY. 2 VOLS.

ACADEMIC PRESS, N.Y., LONDON. 1236 P.

THE FIRST VOLUME DEALS WITH THE BIOLOGICAL ASPECTS OF THE WORLD'S DESERTS. IT FOCUSES ON THE FORCES CAUSING DESERT AND ARID REGIONS, THE EVOLUTION OF DESERT PLANTS, WATER ECONOMY, DESERT ECOLOGY AND LIMNOLOGY, POISONS, DESERT ANIMALS, AND THE ADAPTATION AND BEHAVIOR OF PLANTS, REPTILES, AMPHIBIA, BIRDS, FISH AND MAMMALS (INCLUDING MAN). THE SECOND VOLUME DISCUSSES HYDROGEOLOGY OF ARID REGIONS, DESERT SOILS, PHYSICAL AND VEGETATIONAL ASPECTS OF THE SAHARA DESERT, DESERT ALGAE, LICHENS, AND FUNGI, A NEW APPROACH TO WATER RELATIONS OF DESERT PLANTS, DESERT ARTHROPODS AND FISHES, AND MAN IN ARID LANDS (PARTICULARLY THE PIMAN INDIANS OF THE SONORAN DESERT AND THE MADA'IN SALIH VALLEY IN THE NORTHWESTERN CORNER OF SAUDI ARABIA).

OALS/DESERT ANIMALS/DESERT PLANTS/DESERTIFICATION/ECOLOGY/DESERTS/FISH/ BIOLOGICAL COMMUNITIES/HUMANS/ADAPTATION/REPTILES/AMPHIBIANS/BIRDS/MAMMALS/ SAHARA/DESERT SOILS/DESERT SURVIVAL/HYDROGEOLOGY/MICROORGANISMS/INSECTS

6

BROWN, L.H.

1971

THE BIOLOGY OF PASTORAL MAN AS A FACTOR IN CONSERVATION.

BIOLOGICAL CONSERVATION 3(2):93-100.

A DISCUSSION OF THE BASIC RELATIONSHIP BETWEEN THE DIETETIC NEEDS OF PASTORAL PEOPLE, THE NUMBERS OF STOCK THEY MUST KEEP TO SUPPLY THESE NEEDS, AND THE PRODUCTIVE CAPACITY OF THE ENVIRONMENT. USUALLY, OVERGRAZING AND EROSION IN PASTORAL AREAS IS ATTRIBUTED TO PRESTIGE OVERSTOCKING, BUT IT IS SHOWN HERE THAT THERE IS A BASIC MINIMUM NUMBER OF ANIMALS REQUIRED TO SUPPORT A HUMAN FAMILY. THIS REQUIREMENT IS ABOUT 3 STANDARD STOCK UNITS EACH OF 500 KILOGRAMS, LIVE-WEIGHT PER HEAD, BUT VARIES FROM 2.5-4.5 ACCORDING TO THE ECOLOGICAL CONDITIONS, AND IS MADE UP OF VARIOUS CLASSES OF STOCK THAT ARE KEPT FOR MEAT OR MILK. WHEN RISING HUMAN POPULATION BECOMES TOO GREAT TO PERMIT EACH FAMILY TO MAINTAIN THIS NECESSARY MINIMUM HERD, DAMAGE TO THE ENVIRONMENT THROUGH OVERSTOCKING BECOMES INEVITABLE. IN ADDITION, BY COMPETING FOR THE AVAILABLE MILK SUPPLY, THE PASTORAL PEOPLES INEVITABLY STARVE THE CALVES AND DEPRESS THE QUALITY OF THEIR STOCK, PARTICULARLY WHERE HUMAN POPULATIONS ARE HIGH. IN MANY AREAS, THE PREVALENT OVERGRAZING SITUATION IS SEEN AS ONE OF HUMAN OVER-POPULATION--REQUIRING THE REMOVAL OF HUMANS, ALTERATION OF THEIR DIETETIC HABITS, AND MERE REDUCTION OF STOCK NUMBERS. METHODS FOR ALLEVIATING THE SITUATION MIGHT INCLUDE PARTIAL DEPENDENCE ON BOUGHT GRAIN, OR SETTLEMENT ON IRRIGATION SCHEMES, BUT NONE ARE EASY OR SHORT-TERM.

OALS/NOMADS/FOOD HABITS/NUTRIENT REQUIREMENTS/FORAGE SUPPLY/LIVESTOCK/ FORAGE PRODUCTION/GRAZING/PERTURBATION/ANIMAL DAMAGE/LIMITING FACTORS/ ECOLOGY/POPULATIONS/CARRYING CAPACITY/HUMAN BEHAVIOR

7

BUDYKO, M.I./DROZODOV, O.A./YUDIN, M.I.

1971

THE IMPACT OF ECONOMIC ACTIVITY ON CLIMATE.

SOVIET GEOGRAPHY: REVIEW AND TRANSLATION 12(10):666-679. [TRANSLATED FROM M.I. BUDYKO, ED., SOVREMENNYYE PROBLEMY KLIMATOLOGII. GIDROMETEOIZDAT, LENINGRAD, 1966.] SWRA W72-07046.

THE CLIMATIC CONSEQUENCES OF A VARIETY OF HUMAN ACTIVITIES ARE EXAMINED IN TERMS OF THEIR EFFECTS ON LOCAL ENERGY BALANCES. CITIES CONSUME ENERGY AT RAPID RATES, AND LEAD TO INCREASES IN LOCAL AIR TEMPERATURES. THIS EFFECT IS FURTHER HEIGHTENED BY AIR POLLUTION WHICH ATTENUATES OUTGOING LONG-WAVE RADIATION. ADDITIONALLY, THE GREATER SURFACE ROUGHNESS AND HIGHER SENSIBLE HEAT FLUX DURING WARM PERIODS COMBINE TO INTENSIFY VERTICAL CURRENTS AND MAY RESULT IN PRECIPITATION INCREASES. FOREST CANOPIES TEND TO ABSORB MORE SOLAR ENERGY THAN OPEN LAND, WHICH MAINLY HEATS THE CANOPY AND EVAPORATES WATER. THE ABSENCE OF WIND WITHIN THE FOREST AND THE LESSENED SENSIBLE HEAT FLUX TEND TO SMOOTH DIURNAL TEMPERATURE FLUCTUATION. NIGHTTIME COOLING IS MINIMIZED BY ATMOSPHERIC THERMAL STRATIFICATION WHICH HINDERS HEAT EXCHANGE. DEFORESTATION RESULTS IN A DROP IN MEAN ANNUAL AIR TEMPERATURE AND AN INCREASE IN DIURNAL RANGE. IRRIGATION IN THE ARID ZONE PRODUCES SIGNIFICANT CHANGES IN THE HEAT AND WATER EXCHANGE AT THE AIR-GROUND SURFACE. NORMALLY, MOST INCOMING RADIATION IN THE DESERT HEATS THE ATMOSPHERE THROUGH SENSIBLE HEAT FLUX, THE TEMPERATURE OF AIR MASSES RISE AND RELATIVE HUMIDITY DROPS. AS A RESULT OF IRRIGATION, EVAPORATION INCREASES AND THE TEMPERATURE OF THE GROUND SURFACE DECREASES. (OALS)

OALS/ARID LANDS/MICROCLIMATOLOGY/AIR TEMPERATURE/HEAT TRANSFER/ENERGY BUDGET/HUMIDITY/PRECIPITATION(ATMOSPHERIC)/ENVIRONMENTAL EFFECTS/FORESTS/ AIR POLLUTION/CLIMATE/VEGETATION EFFECTS/AIR MASSES/AIR CIRCULATION/CLIMATIC CHANGE/ADVECTION/ECONOMIC IMPACT/DIURNAL/VARIABILITY(ENVIRONMENTAL)

8

BUTZER, K.W.

1961

CLIMATIC CHANGE IN ARID REGIONS SINCE THE PLIOCENE. IN L.D. STAMP, ED., A HISTORY OF LAND USE IN ARID REGIONS.

UNESCO, PARIS. ARID ZONE RESEARCH 17:31-56.

THIS IS A COMPREHENSIVE REVIEW OF CLIMATIC CHANGE IN ARID REGIONS SINCE THE PLIOCENE, WITH EMPHASIS ON RECENT CHANGES. THE FIRST SECTION REVIEWS CLIMATE AND GENERAL CIRCULATION. FOLLOWING IS A DISCUSSION OF THE PLUVIALS AND INTERPLUVIALS OF THE PLEISTOCENE; CLIMATE AND CLIMATIC VARIATION OF THE LAST 2,000 YEARS; AND RECENT CLIMATIC FLUCTUATION IN ARID REGIONS, DISCUSSED BY CONTINENTS. THE FINAL SUBSECTION INCLUDES METEOROLOGICAL IMPLICATIONS OF RECENT FLUCTUATIONS AND PROSPECTS OF FUTURE DEVELOPMENTS. THE AUTHOR CONCLUDES THAT THE ULTIMATE CAUSES OF CIRCULATION CHANGES ARE SO FAR BEYOND THE COMPASS OF HUMAN OBSERVATION THAT ALL ATTEMPTS TO FORECAST FUTURE TRENDS ARE PURELY SPECULATIVE OR INTUITIVE AS YET. THE GREAT CLIMATIC SHIFTS OF THE LAST CENTURY INDICATE THE INSTABILITY OF THE PRECIPITATION-EVAPORATION CYCLE IN THE MARGINAL LANDS OF THE ARID ZONE. THE MEN AGAINST THE DESERT MUST REMAIN AWARE OF THE DYNAMIC CHARACTER OF THE GENERAL ATMOSPHERIC CIRCULATION, THAT CLIMATOLOGICAL MEANS CANNOT EXPRESS A PROCESS SUCH AS WEATHER.

ARID CLIMATE/OALS/SEMIARID CLIMATE/ARID LANDS/HISTORY/CLIMATOLOGY/ METEOROLOGY/WEATHER PATTERNS/DESERTS/PALEOCLIMATOLOGY/CLIMATIC ZONES/ DROUGHTS/SYNOPTIC CLIMATOLOGY/GEOLOGIC TIME/ATMOSPHERIC CIRCULATION

9

BUTZER, K.W./TWIDALE, C.R.

1966

DESERTS IN THE PAST. IN E.S. HILLS, ED., ARID LANDS: A GEOGRAPHIC APPRAISAL, P. 127-144.

METHUEN, LONDON. MGA 19.11-481.

DISCUSSIONS OF CRITERIA OF CLIMATIC CHANGE INCLUDING LACUSTRINE CONDITIONS, RIVER TERRACES, PALYNOLOGY, SEDIMENTS AND FOSSIL SOILS, DUNE FORMS, DENDROCHRONOLOGY, AND ARCHAEOLOGY. EMPHASIS IS ON PLUVIAL PERIODS OF THE QUATERNARY.

DESERTIFICATION/CLIMATIC CHANGE/DESERTS/PHYSICAL GEOGRAPHY/ARCHAEOLOGY/HISTORY/QUATERNARY PERIOD/PLEISTOCENE EPOCH

10

CLOUDSLEY-THOMPSON, J.L./CHADWICK, M.J.

1964

LIFE IN DESERTS.

G.T. FOULIS, LONDON; DUFOUR, PHILADELPHIA. 218 P.

VARIOUS ECOLOGICAL AND PHYSIOLOGICAL MECHANISMS OF PLANT AND ANIMAL ADAPTATION TO DESERT ENVIRONMENTS ARE DISCUSSED. THE DESERT ENVIRONMENT IS DESCRIBED, FOLLOWED BY SECTIONS ON FLORA (INJURY, TOLERANCE, EVASION, AVOIDANCE, ETC.) AND FAUNA (PHYSIOLOGICAL ADAPTATIONS OF INVERTEBRATES AND VERTEBRATES). THE FINAL SECTION DEALS WITH THE DESERT COMPLEX (I.E., THE MAZE OF BIOLOGICAL INTERRELATIONSHIPS, COMBINED WITH CLIMATIC AND TOPOGRAPHIC FACTORS). (OALS)

OALS/WGM/NPS-ONS/DESERTS/PHYSIOLOGICAL ECOLOGY/ANIMALS/PLANT PHYSIOLOGY/ANIMAL PHYSIOLOGY/ENVIRONMENT/ADAPTATION/VEGETATION/TOPOGRAPHY/CLIMATE/DROUGHT TOLERANCE/CLIMATIC-VEGETAL RELATIONSHIPS/BIOGEOGRAPHY/BIOCLIMATOLOGY/DESERT BIOME

11

COOPER, C.F./JOLLY, W.C.

1969

PRECIPITATION MODIFICATION IN SEMIARID AND ARID REGIONS. IN C.F. COOPER AND W.C. JOLLY, ECOLOGICAL EFFECTS OF WEATHER MODIFICATION, A PROBLEM ANALYSIS, P. 22-33.

UNIVERSITY OF MICHIGAN, SCHOOL OF NATURAL RESOURCES. SWRA W70-09959.

WEATHER MODIFICATIONS IN SEMIARID AND ARID AREAS WILL BE AIMED TOWARD INCREASING PRECIPITATION IN AGRICULTURAL AND MUNICIPAL AREAS AND INCREASING MOUNTAIN SNOWFALL TO AUGMENT DOWNSTREAM RUNOFF. THE EFFECTS OF THESE PRECIPITATION CHANGES ON VARIOUS ECOSYSTEMS INVOLVED ARE EXAMINED. THE SPECIES DIVERSITIES OF NATURAL GRASSLANDS ARE REMARKABLY STABLE AS SHOWN BY RESPONSES TO THE DROUGHT OF THE 1930'S AND TO ARTIFICIAL PRECIPITATION EXPERIMENTS. THE DOMINANT SPECIES COMPOSITION VARIES OVER TIME AND SPACE WITH RAINFALL ACCORDING TO NATURAL VEGETATIONAL MOSAIC SELF-REGULATING MECHANISMS, WHICH MAY ALSO BE INFLUENCED BY GRAZING INTENSITY AND SELECTIVITY. MAMMALIAN POPULATIONS WILL RESPOND TO WEATHER MODIFICATIONS AS COMPLEX FUNCTIONS OF VEGETATIONAL CHANGES. A CRUCIAL POINT IS THAT WEATHER MODIFICATION INVOLVING CLOUD SEEDINGS IS UNLIKELY TO ALLEVIATE SEVERE DROUGHTS SINCE THEY ARE ASSOCIATED WITH AIR PATTERNS WHICH INHIBIT CLOUD FORMATION. THE 10-14 INCH AVERAGE ANNUAL RAINFALL RANGE IS CRITICAL TO STREAM BEDS SINCE VARIATIONS ON EITHER SIDE OF IT WILL EFFECT CHANGES IN RUNOFF FLOW AND SEDIMENT YIELD ALTERING STREAM CHANNEL CHARACTERISTICS. (OALS)

OALS/WEATHER MODIFICATION/ARID LANDS/ARID CLIMATE/SEMIARID CLIMATE/ RUNOFF/PRECIPITATION(ATMOSPHERIC)/DROUGHTS/ENVIRONMENTAL ENGINEERING/ ECOLOGY/WATER YIELD IMPROVEMENT/CLOUD SEEDING/ARTIFICIAL PRECIPITATION

12

DEVGON, U.

1974

MAN AGAINST THE DESERT.

TOPIC (U.S. INFORMATION AGENCY) 83:29-35.

SURVEYS THE WORLD-WIDE PROBLEM OF DESERTIFICATION. A HISTORICAL REVIEW OF THE PROBLEM INCLUDES DISCUSSION OF ANCIENT CIVILIZATIONS AND THE AMERICAN DUST BOWL CRISIS OF THE 1930'S. DESERT ADVANCE IS SEEN AS THE RESULT OF A COMBINATION OF CLIMATIC CHANGES AND HUMAN MISUSE OF LAND, PRIMARILY THROUGH BADLY MANAGED AGRICULTURAL PRACTICES. PILOT PROGRAMS IN TUNISIA, THE SUDAN, LIBYA, NIGER, AND INDIA, IN WHICH PROTECTIVE MEASURES ARE BEING USED TO CONSERVE ARABLE LAND AND PREVENT FURTHER LOSS TO THE DESERT ARE EXAMINED. WATER MANAGEMENT PRACTICES IN THE UNITED STATES, MIDDLE EAST, AND AFRICA ARE ALSO DISCUSSED. THE SAHEL REGION OF AFRICA IS DISCUSSED AS AN EXAMPLE OF A COMPLEX DESERTIFICATION PROBLEM AND OF THE MEASURES WHICH ARE NEEDED TO UNDERSTAND AND BEGIN TO SOLVE IT. THE NEED FOR INCREASED RESEARCH INTO THE COMPLETE DESERT ECOSYSTEM AND THE HUMAN AND NATURAL PRESSURES WHICH MAY AFFECT IT IS STRESSED.

DESERTIFICATION/CLIMATIC CHANGE/DESERTS/VEGETATION CHANGE/GRAZING/LIBYA/ PERTURBATION/SAND CONTROL/SAHELIAN ZONE/SUDAN/SEMIARID CLIMATE/NIGER/ TUNISIA/INDIA/RAJASTHAN/EROSION/DENUDATION/EROSION CONTROL/WINDBREAKS/ LAND MANAGEMENT/ENVIRONMENTAL IMPACT/WATER MANAGEMENT/IRRIGATION/ DESALINIZATION PROCESSES/SURFACE WATER RUNOFF/GEOTHERMAL POWER/ARID LANDS/ WATER SOURCES

13

DREGNE, H.E.

1969

INTERNATIONAL ARID LANDS CONFERENCE.

NATURE AND RESOURCES 5(3):7-12. SWRA W71-03340.

A CENTRAL OBSERVATION OF THIS SUMMARY IS THE EXPANSION OF DESERT AREAS THROUGHOUT THE WORLD BECAUSE OF HUMAN MISMANAGEMENT. EXISTING ARID AREAS HAVE GENERALLY DETERIORATED IN TERMS OF SOIL, WATER AND PLANT LIFE. A MAJOR FACTOR IS OVERGRAZING. DEVELOPMENT PLANS IN ARID LANDS HAVE USUALLY INVOLVED INCREASED WATER SUPPLIES FOR AUGMENTED AGRICULTURAL PRODUCTION. THIS CONCEPT OF ARID LAND DEVELOPMENT WAS CHALLENGED ON SEVERAL GROUNDS. 1) CONSTRUCTION PROJECTS RECEIVE MORE DETAILED PLANNING THAN THE AGRICULTURAL SYSTEMS THEY ARE DESIGNED TO SUPPLY. 2) HIGH INTENSITY DESERT IRRIGATION SCHEMES REQUIRE HIGH LEVELS OF FARMING SKILLS AND MAINTENANCE CAPITAL. 3) INCREMENTS IN PER CAPITA INCOME RESULTING FROM AGRICULTURAL DEVELOPMENT ARE SMALL. 4) TOURISM, MINING, PASTORALISM, LOW WATER-USE INDUSTRY AND OTHER INCOME-PRODUCERS MAY BE MUCH MORE DESIRABLE. POPULATION PRESSURES MUST BE ALLEVIATED OR NO PROGRESS WILL BE POSSIBLE. SOCIOLOGICAL AND ECONOMIC FACTORS UNIQUE TO THESE AREAS, PARTICULARLY EDUCATION, HAVE BEEN NEGLECTED. THE 3 SEPARATE MAJOR ARID AREAS OF THE WORLD ARE DISCUSSED AND NATIONAL AND INTERNATIONAL MEANS OF ATTACKING THEIR PROBLEMS ARE SUGGESTED. (OALS)

OALS/DESERTIFICATION/PERTURBATION/DESERTS/DEGENERATION/NATURAL RESOURCES/LAND MANAGEMENT/SOCIAL ASPECTS/ECONOMIC DEVELOPMENT/ IRRIGATION PROGRAMS

14

DREGNE, H.E. ED.

1970

ARID LANDS IN TRANSITION.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C., PUBLICATION 90. 524 P.

INVITED PAPERS GIVEN AT A 1969 CONFERENCE IN TUCSON, ARIZONA, JOINTLY SPONSORED BY AAAS AND UNESCO ON 'ARID LANDS IN A CHANGING WORLD'. [A SUMMARY APPEARED IN NATURE AND RESOURCES 5(3):7-12.]

HYDROLOGY/IRRIGATION PROGRAMS/PERTURBATION/NATURAL RESOURCES/SOCIAL ASPECTS/ POLITICAL ASPECTS/LIVESTOCK/NOMADS/ECONOMIC DEVELOPMENT/DESERTIFICATION/ MINING/WATER MANAGEMENT

15

ECKHOLM, E.P.

1975

DESERTIFICATION: A WORLD PROBLEM.

AMBIO 4(4):137-145.

OVERGRAZING AND OVERLY INTENSIVE CROPPING ENCOURAGE THE SPREAD OF DESERTS IN AFRICA, ASIA, AND LATIN AMERICA, AND UNDERMINE THE PRODUCTIVITY OF VAST SEMIARID ZONES THROUGHOUT THE WORLD. THE EVIDENCE OF DESERT ENCROACHMENT WORLDWIDE IS SURVEYED, AND THE IMPLICATIONS OF RECENT CLIMATIC CHANGE THEORIES ARE DISCUSSED. DIRECTIONS FOR THE ECOLOGICALLY SUSTAINABLE EXPLOITATIONS OF ARID LANDS ARE OUTLINED.

DESERTS/DESERTIFICATION/DESICCATION/GRAZING/PERTURBATION/CLIMATIC CHANGE/ ECOLOGY/ENVIRONMENTAL IMPACT/ARID LANDS/SEMIARID CLIMATE/CROP PRODUCTION/ ANIMAL DAMAGE/OVERGRAZING/DROUGHTS

16

FLEAGLE, R.G. ED.

1969

WEATHER MODIFICATION; SCIENCE AND PUBLIC POLICY.

UNIVERSITY OF WASHINGTON PRESS, SEATTLE. 147 P.

PAPERS PRESENTED TO THE NATURAL RESOURCES PUBLIC POLICY SEMINAR AT THE UNIVERSITY OF WASHINGTON, PLANNING FOR WHICH WAS STIMULATED BY THE VIEW THAT IMPORTANT PUBLIC POLICY ISSUES IN THE FIELD OF WEATHER MODIFICATION HAD NOT YET BEEN ADEQUATELY EXAMINED AND THAT RESOLUTION OF THESE ISSUES MUST BE BASED ON UNDERSTANDING OF THE SCIENTIFIC AND TECHNICAL POSSIBILITIES, AND EQUALLY ON UNDERSTANDING THE ADMINISTRATIVE, LEGAL, ECONOMIC, AND POLITICAL CONSTRAINTS THAT SURROUND THE SUBJECT. CONSENSUS WAS THAT TECHNICAL ACTIVITIES SHOULD NOT BE UNDERTAKEN UNTIL THEIR CONSEQUENCES ARE UNDERSTOOD AND THAT THEY MUST BE PLANNED AND CARRIED OUT IN A MANNER RESPONSIBLE TO ALL CONCERNED. (OALS)

OALS/WEATHER MODIFICATION/LEGAL ASPECTS/SOCIAL ASPECTS/ENVIRONMENTAL ENGINEERING/POLITICAL ASPECTS

17

FURNESS, F.N. ED.

1961

SOLAR VARIATIONS, CLIMATIC CHANGE, AND RELATED GEOPHYSICAL PROBLEMS.

NEW YORK ACADEMY OF SCIENCES, ANNALS 95(1):1-740.

SOLAR RADIATION/CLIMATIC CHANGE/GEOPHYSICS

18

GARDNER, J.L./MYERS, L.E. EDS.

1967

WATER SUPPLIES FOR ARID REGIONS.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION, COMMITTEE ON DESERT AND ARID ZONES RESEARCH, CONTRIBUTION 10. 62 P. SWRA W70-06677.

WATER SUPPLY PROBLEMS IN ARID REGIONS CANNOT BE SOLVED UNLESS ALL ASPECTS OF THE PROBLEMS ARE GIVEN PROPER CONSIDERATION. OBTAINING ADDITIONAL WATER BY IMPORTATION, DESALINATION, CLOUD SEEDING, OR INCREASING PRECIPITATION RUNOFF FROM WATERSHEDS IS NECESSARY BUT NOT SUFFICIENT. ATTENTION MUST ALSO BE PAID TO WATER POLLUTION, ALTERNATIVE WATER USES, REUSE OF WATER, AND THE ACCUMULATION OF SALT IN GROUNDWATER AND SOILS. THESE PROBLEMS ARE PARTICULARLY ACUTE IN ARID REGIONS WHERE WATER SUPPLIES ARE LIMITED AND HARMFUL SALTS AND WASTES ARE NOT REMOVED BY AN OUTFLOW OF WATER FROM THE REGIONS.

OALS/ARID LANDS/WATER SUPPLY/WATER TRANSFER /DESALINATION/CLOUD SEEDING/RUNOFF/WATER CONSERVATION/WATER REUSE/WATER YIELD IMPROVEMENT/ SALINE WATER/ENVIRONMENTAL ENGINEERING

19

GIBBS, W.J./LANDSBERG, H.E./RODIER, J.A.

1975

DROUGHT. LECTURES PRESENTED AT THE 26TH SESSION OF THE WMO EXECUTIVE COMMITTEE.

WORLD METEOROLOGICAL ORGANIZATION, GENEVA, SPECIAL ENVIRONMENTAL REPORT 5. 113 P.

FULL TEXT OF THREE PAPERS BY EXPERTS ON DROUGHT, ITS DEFINITION, DELINEATION AND EFFECTS; DROUGHT, A RECURRENT ELEMENT OF CLIMATE; AND ESTIMATES OF HYDROLOGIC DATA ON THE 1970-1973 DROUGHT IN TROPICAL AFRICA. THE FIRST, BASED ON THE AUSTRALIAN VIEW, WARNS THAT THERE APPEARS TO BE LITTLE HOPE OF AMELIORATING DROUGHT BY ARTIFICIAL WEATHER MODIFICATION, SINCE DROUGHT PERIODS ARE USUALLY CHARACTERIZED BY LARGE-SCALE SUBSIDENCE AND CLOUD-FREE SKIES, AND COUNSELS PLANNING IN ADVANCE FOR RESPONSES TO SUCH DISASTERS, AND CREATION OF WORLDWIDE DROUGHT ALERTING SERVICES. THE SECOND PAPER EMPHASIZES THAT IT IS THE MARGINAL LANDS MOST AFFECTED BY FREQUENCY AND SEVERITY OF DROUGHT, AND UNLESS CULTIVATION IS PRACTICED WITH CARE, DESERTIFICATION IS AN EVER-PRESENT DANGER. DATA ARE PRESENTED RELATING TO CHANGES IN LARGE CIRCULATION PATTERNS THAT MAY AFFECT SUCH AREAS. THE THIRD GIVES EXAMPLES FROM THE HYDROLOGY OF LARGE RIVER BASINS, WITH EMPHASIS ON MEAN ANNUAL DISCHARGES, ANNUAL MAXIMUM VALUES OF DISCHARGES, AND THE MINIMUM VALUES FOR 1972-1973 FOR SENEGAL, NIGER, AND CHARI.

DROUGHTS/HYDROLOGIC DATA/METEOROLOGICAL DATA/DESERTIFICATION/RIVER BASINS/ SENEGAL/NIGER/CHAD/AUSTRALIA/ATMOSPHERIC CIRCULATION/PLANTING MANAGEMENT/ SAHELIAN ZONE

20

GOUDIE, A.S.

1972

THE CONCEPT OF POST-GLACIAL PROGRESSIVE DESICCATION.

OXFORD UNIVERSITY, SCHOOL OF GEOGRAPHY, RESEARCH PAPER 4. 48 P.

IN A CRITICAL DISCUSSION OF THE OFTEN-PROCLAIMED THESIS OF PROGRESSIVE DESICCATION OF THE EARTH SINCE THE PLEISTOCENE THE AUTHOR CONSIDERS IN SOME DETAIL THE EVIDENCE OF 'DEAD' DUNE-FIELDS, FORMER EXPANDED LAKES IN ARID REGIONS, THE DISCHARGE RECORDS OF SELECTED RIVERS, AND SELECTED RECORDS OF PRECIPITATION. HE CONCLUDES THAT THERE IS NO CONVINCING AND CONSISTENT EVIDENCE OF A WORLD-WIDE TREND TOWARDS GREATER CLIMATIC ARIDITY. LOCAL CHANGES RECORDED, IF TRULY OF CLIMATIC ORIGIN, APPEAR TO BE OSCILLATORY IN CHARACTER, AND ARE OFTEN OUT OF PHASE WITH ONE ANOTHER. OTHER CHANGES CAN OFTEN BE CONVINCINGLY RELATED TO LOCAL PHYSIOGRAPHIC CHANGE, OR TO HUMAN ACTION. A WIDE RANGE OF REFERENCES IS CITED.

DESICCATION/CLIMATIC CHANGE/FOSSIL DUNES/ENVIRONMENTAL IMPACT/DUNES/LAKES/ PALEOGEOGRAPHY

21

GROVE, A.T.

1968

MORPHOLOGY OF ARID ZONE BASINS.

INTERNATIONAL GEOGRAPHICAL CONGRESS, 21ST, DELHI, 1968, ABSTRACTS OF PAPERS, P. 328-329.

BASINS IN THE ARID ZONE, ALONG THE SOUTH SIDE OF THE SAHARA IN THE INTERIOR OF SOUTHERN AFRICA AND IN SOUTH-CENTRAL AUSTRALIA PRESENT ASSEMBLAGES OF LANDFORMS THAT HAVE MUCH IN COMMON. AT THE MARGINS OF THE BASINS, RUGGED UPLANDS BORDERED BY DISSECTED PLATEAUS CAPPED WITH DURICRUST PRESENT POSSIBILITIES FOR TRACING EROSIONAL HISTORY. IN THE CENTRAL PARTS OF THE BASINS, TERTIARY AND QUATERNARY SEDIMENTS, PLUS CALCRETES AND SILCRETES, PROVIDE COMPLEMENTARY INFORMATION. THE LATER QUATERNARY HISTORY OF THE BASINS, IS RECORDED IN THE DUNES AND LAKE DEPOSITS AND STRANDLINES OF THE BASIN FLOORS. ARID CONDITIONS, MORE INTENSE AND EXTENSIVE THAN THOSE OF THE PRESENT DAY, AFFECTED THE SENEGAL, INLAND NIGER AND CHAD BASINS, THE KALAHARI AND LAKE EYRE REGION. THEY ARE REPRESENTED BY DUNEFIELDS, CONSISTING MAINLY OF MASSIVE LONGITUDINAL DUNES AT THE SOUTHERN MARGINS OF THE SAHARA AND IN THE NORTHERN KALAHARI, AND BY SAND RIDGES IN THE LAKE EYRE REGION AND SOUTHERN KALAHARI. CONDITIONS HAVE AMELIORATED AND THE DUNES ARE LARGELY COVERED BY VEGETATION. IN THE SAHARAN BASINS, LAKE DEPOSITS AND STRANDLINES SHOW THAT THE CLIMATE WAS MUCH WETTER THAN NOW ABOUT THE COMMENCEMENT OF THE HOLOCENE. NEW INFORMATION IS PRESENTED FROM THE KALAHARI, ABOUT A LARGE LAKE THAT OCCUPIED THE MAKARIKARI DEPRESSION, POSSIBLY ABOUT THIS TIME. THE EXTENSVE SYSTEMS OF FIXED DUNES IN THE KALAHARI ARE COMPARED WITH THOSE ALONG THE SOUTH SIDE OF THE SAHARA AND IN AUSTRALIA.

OALS/LANDFORMS/GEOMORPHOLOGY/BASINS/SAHARA/KALAHARI-NAMIB/LAKE EYRE/ CLIMATIC CHANGE/DUNES/QUATERNARY PERIOD/GEOGRAPHICAL ORIGIN

22

HARE, F.K.

1961

THE CAUSATION OF THE ARID ZONE.

UNESCO, PARIS. ARID ZONE RESEARCH 17:25-30.

THE ARIDITY OF THE SUBTROPICS EMERGES AS AN ASPECT OF WORLD CLIMATE DEPENDENT ON DEEP-SEATED FEATURES OF THE EARTH'S GENERAL ATMOSPHERIC CIRCULATION. IT DOES NOT ARISE FROM LOCAL OR MAN-MADE CIRCUMSTANCES, BUT FROM NATURAL CAUSES INVOLVING EXCEEDINGLY LARGE ENERGY TRANSFORMATIONS AND MOMENTUM TRANSPORTS. IT IS INCONCEIVABLE THAT THE REGIME CAN BE SIGNIFICANTLY ALTERED BY HUMAN INTERVENTION. IT IS EQUALLY UNLIKELY THAT ANY PAST CLIMATIC EPOCH CAN HAVE EXPERIENCED A COMPLETE ABSENCE OF SUBTROPICAL ARIDITY. THE MAINTENANCE OF THE MID-LATITUDE WESTERLIES ABSOLUTELY REQUIRES THE EXISTENCE OF COMPENSATING EASTERLIES IN THE TROPICS. SIMILARLY THE TRANSFER OF MOMENTUM AND HEAT NORTHWARD IN THE TROPICS REQUIRES THE EXISTENCE OF A HADLEY CELL, WELL SUBSIDENCE (AND HENCE LOW HUMIDITY AND DROUGHT) AT SOME SUBTROPICAL LATITUDE. HENCE IT SEEMS LIKELY THAT THE ARID ZONE CAN HAVE BEEN NO MORE THAN CONSTRICTED IN EXTENT AND DRIVEN A FEW DEGREES EQUATORWARD AT THE HEIGHT OF THE RECENT GLACIATION; IT CAN HARDLY HAVE BEEN ELIMINATED ALTOGETHER. (AUTHOR)

OALS/ARID CLIMATE/CLIMATIC ZONES/METEOROLOGY/AIR MASSES/DISTRIBUTION/ GENERAL CIRCULATION/ATMOSPHERIC CIRCULATION/WIND(METEOROLOGY)/SYNOPTIC CLIMATOLOGY/ARIDITY

23

HUNTINGTON, E./VISHER, S.S.

1922

CLIMATIC CHANGES, THEIR NATURE AND CAUSES.

YALE UNIVERSITY PRESS, NEW HAVEN, CONNECTICUT. 329 P.

CLIMATIC CHANGE/CLIMATOLOGY

24

JACKSON, R.D./IDSO, S.B.

1975

SURFACE ALBEDO AND DESERTIFICATION.

SCIENCE 189:1012-1013.

MEASUREMENTS ARE MADE OF SURFACETEMPERATURE, AIR TEMPERATURE, AND SURFACE ALBEDO OF FOUR DIFFERENT SOILS, EACH UNDER BOTH WET AND DRY CONDITIONS. WHEN BARE SOILS ARE WET, SURFACE TEMPERATURE IS NEARLY EQUAL TO AIR TEMPERATURE AND IS INSENSITIVE TO CHANGES IN SURFACE ALBEDO. WHEN BARE SOILS ARE DRY, SURFACE TEMPERATURE RISES VERY FAR ABOVE AIR TEMPERATURE AND IS VERY SENSITIVE TO ALBEDO. FOR SOILS COVERED WITH VEGETATION, LEAF TEMPERATURE IS ONLY SLIGHTLY DIFFERENT FROM AIR TEMPERATURE IN WET SOILS AND ONLY UP TO TEN DEGREES HIGHER THAN AIR TEMPERATURE IN DRY SOILS. SOIL SURFACE TEMPERATURES ARE ALWAYS HIGHER THAN AIR TEMPERATURES, EVEN AT THE HIGHEST ALBEDO LEVELS. IT IS CONCLUDED THAT DENUDATION OF AN AREA AND THE CONSEQUENT RISE IN ALBEDO CAN NOT LEAD TO LOWER SOIL SURFACE TEMPERATURES AND HENCE TO EVENTUAL LOWER RAINFALL OVER THE DENUDED AREA. THIS THEORY OF DESERTIFICATION IN DENUDED AREAS IS THUS DISCOUNTED.

DESERTIFICATION/ALBEDO/SOLAR RADIATION/SOIL TEMPERATURE/PLANT COVER/ SOIL MOISTURE/AIR TEMPERATURE/SOIL SURFACES/CLIMATIC CHANGE

25

KAUL, R.N. ED.

1970

AFFORESTATION IN ARID ZONES.

W. JUNK, THE HAGUE. 435 P. (MONOGRAPHIAE BIOLOGICAE, 20)

COVERS SEVEN MAJOR WORLD ARID REGIONS, EXCLUDING MEXICO, BRAZIL, AND SOUTHERN AFRICA. RECOMMENDS PLANTING MATERIALS AND TECHNIQUES TO MEET THE NEEDS OF SPECIFIC AREAS AND INCLUDES ENOUGH INFORMATION ON VARIOUS ENVIRONMENTS TO ENABLE INTRODUCTION OF SPECIES FROM ONE AREA TO ANOTHER. DISCUSSIONS OF ENVIRONMENT INCLUDE MAGHREB OF AFRICA,

TUNISIA, ALGERIA, AND MOROCCO, INDO-PAKISTAN, U.S.S.R., CENTRAL ASIA, ARGENTINA, AND AUSTRALIA. OUTSTANDING VEGETATION DISCUSSIONS INCLUDE INDO-PAKISTAN, ARGENTINA, U.S.S.R., AND CENTRAL ASIA. THE AIMS OF AFFORESTATION GIVE HIGH PRIORITY TO STABILIZATION OF SURFACE MATERIALS AND THE PREVENTION OF EROSION. THE CHOICE OF SPECIES IS LARGELY DEPENDENT ON NEEDS FOR SPECIFIC PURPOSES AND THE AVAILABILITY OF SUITABLE SPECIES. EXOTICS ARE GENERALLY MORE WIDELY USED THAN NATIVE SPECIES AND INCLUDE EUCALYPTUS, ESPECIALLY, AS WELL AS ACACIA, PROSOPIS, AND TAMARIX. (OALS)

PAKISTAN/OALS/AFFORESTATION/ARID LANDS/PLANT COVER/REFORESTATION/ PHYTOGEOGRAPHY/AFRICA/TUNISIA/ALGERIA/MOROCCO/INDIA/USSR/EROSION CONTROL/INTRODUCED SPECIES/EUCALYPTUS/ACACIA/PROSOPIS/TAMARIX/ ECOSYSTEMS/SHELTERBELTS /DESERTIFICATION

26

KELLOGG, C.E.

1953

POTENTIALITIES AND PROBLEMS OF ARID SOILS. IN DESERT RESEARCH. PROCEEDINGS, INTERNATIONAL SYMPOSIUM HELD IN JERUSALEM, MAY 7-14, 1952.

RESEARCH COUNCIL OF ISRAEL, SPECIAL PUBLICATION 2:19-42.

IT IS ESTIMATED THAT PERHAPS 80 MILLION ADDITIONAL HECTARES OF ARID SOILS COULD BE IRRIGATED ECONOMICALLY IF THEY WERE SELECTED AND MANAGED SKILLFULLY, UNDER ADEQUATE ADMINISTRATIVE SCHEMES. CHARACTERISTICS OF IRRIGATED ARID SOILS DIFFER SIGNIFICANTLY FROM THOSE THAT RECEIVE WATER FROM NATURAL DRAINAGE. ACCURATE PREDICTIONS OF THE OUTCOME OF MANAGEMENT PRACTICES ON DIFFERENT KINDS OF ARID SOILS ARE NECESSARY. THIS CAN BE ACCOMPLISHED BY AN ACCURATE APPRAISAL OF SITUATIONS BY A TEAM OF EXPERTS. A GENERAL PROCEDURE FOR EXPLORING AND DEVELOPING AREAS OF ARID SOILS IS OUTLINED BRIEFLY. THE PAPER PRESENTS A DEFINITION OF ARI SOILS, THE GEOGRAPHY, THE CHARACTERISTICS, THE PROPORTION OF NORMAL SOILS IN A D LANDS, SOIL-FORMING PROCESSES, AND SOIL QUALITIES. ALSO DISCUSSED ARE SPECIFIC IDEAS FOR COMBINING RESOURCE USE; STEPS FOR ORDERLY DEVELOPMENT; AND SUMMARY OF RESEARCH NEEDS. THE AUTHOR REPEATEDLY EMPHASIZES THAT UNLESS ALL ASPECTS ARE INVESTIGATED INTENSIVELY BEFORE PROJECTS START THEY ARE INVITING FAILURE. THE THREAT OF STARTING CATASTROPHIC SOIL BLOWING CAUTIONS AGAINST UNNECESSARY DISTURBANCE OF SANDY ARID SOILS UNLESS SUBSEQUENT FIXATION THROUGH IRRIGATED PLANTINGS IS REASONABLY CERTAIN.

OALS/PERMEABILITY/SOIL STRUCTURE/SOIL TEXTURE/SOIL CLASSIFICATIONS/ SOIL MANAGEMENT/B HORIZON/SALINE SOILS/IRRIGATION EFFECTS/ DESERTIFICATION

27

KERR, R.C./NIGRA, J.O.

1952

EOLIAN SAND CONTROL.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, BULLETIN 36(8):1541-1573.

EOLIAN SOILS/SANDS/SAND CONTROL

28

KHARIN, N.G./PETROV, M.P.

1975

GLOSSARY OF TERMS ON DESERT ENVIRONMENT AND LAND RECLAMATION. EDITED BY A.G. BABAYEV.

ACADEMY OF SCIENCES OF TURKMEN SSR, DESERT INSTITUTE, ASHKHABAD, G.S.P.-24. 142 P.

THE COMPILERS OF THIS ENGLISH-LANGUAGE GLOSSARY HAVE AIMED AT SUMMARIZING UNDER ONE COVER GEOGRAPHICAL TERMS ON WORLD DESERTS, INCLUDING PHYSICAL ASPECTS, LOCAL TERMINOLOGY, AND WORDS DEALING WITH PRACTICAL ACTIVITIES OF MAN IN RECLAIMING DESERT LANDS, INCLUDING COLLECTING AND STORING WATER, GRAZING, AFFORESTATION, AND DUNE CONTROL. INCLUDED IS A TRANSLITERATION TABLE, ABBREVIATIONS OF GEOGRAPHICAL NAMES AND LANGUAGES, A BRIEF LIST OF SOURCES USED IN THE COMPILATION, PLUS TABLES AND GRAPHICS TO ILLUSTRATE THE MEANING OF SOME TERMS SUCH AS DUNE TYPES, FOGGARAS, CHIRLYS, ETC. (OALS)

LAND RECLAMATION/DESERTS/DICTIONARIES/DUNES/GRAZING/PHYSICAL GEOGRAPHY/ AFFORESTATION/SAND CONTROL

29

KRUSEMAN, G.P.

1968

TOWARD A GARDEN OR TOWARDS A DESERT.

INTERNATIONAL INSTITUTE FOR LAND RECLAMATION AND IMPROVEMENT, WAGENINGEN, THE NETHERLANDS, ANNUAL REPORT. P. 12-16. GA 70B-504.

WITH A VIEW TO THE FUTURE USE OF LAND AND WATER, EXPERTS SHOULD AIM AT THE CORRECTION OF PAST MISTAKES AND THE PREVENTION OF FUTURE ERRORS SUCH AS SALINIZATION, EROSION, WATERLOGGING AND OVERGRAZING. CONSERVATION OF LAND AND WATER MAY VERY WELL INCLUDE THE CONCENTRATION OF AGRICULTURE IN THOSE AREAS THAT ARE HIGHLY SUITED TO IT. MARGINAL AGRICULTURAL LANDS SHOULD THEN FIND THEIR DESTINY AS DWELLING AREAS, RECREATIONAL PARKS, INDUSTRIAL CENTERS, OR NATURE RESERVES. IT IS EXPECTED THAT A WISE MANAGEMENT OF LAND AND WATER WILL CONTRIBUTE POSITIVELY TO A RATIONAL USE AND CONSERVATION OF THE RESOURCES OF THE BIOSPHERE. SKILLFUL MANAGEMENT OF THE BIOSPHERIC RESOURCES IS A MATTER OF LIFE OR DEATH; IT WILL DETERMINE WHETHER OUR CHILDREN LIVE IN A GARDEN OR DIE IN A DESERT. (AUTHOR)

OALS/ECOSYSTEMS/HUMAN BEHAVIOR/SETTLEMENTS/REFORESTATION/CHEMICAL CONTROLS/LAND MANAGEMENT/NATURAL RESOURCES/DESERTIFICATION

30

LAMB, H.H. ED.

1966

THE CHANGING CLIMATE: SELECTED PAPERS.

METHUEN LONDON. 236 P.

CLIMATIC CHANGE/CLIMATOLOGY

31

LEIBUNDGUT, H.

1955

LES PROBLEMES SYLVICOLES DU REBOISEMENT EN REGIONS ARIDES (SILVICULTURAL PROBLEMS OF REFORESTATION IN ARID REGIONS).

SCHWEIZERISCHE ZEITSCHRIFT FUER FORSTWESEN 106(6/7):356-366.

SOIL MOISTURE SUPPLY IS OF PRIMARY IMPORTANCE IN REFORESTATION OF ARID REGIONS. IF SOIL MOISTURE FALLS TO OR BELOW THE WILTING POINT, THE ALKALINITY, IN MANY INSTANCES, IS TOXIC TO PLANTS, ESPECIALLY ON FLAT GROUND. NATURAL VEGETATION IS ALSO DESTROYED BY GRAZING, FIRE, OR EXCESSIVE CUTTING, ACCOMPANIED BY SEVERE EROSION. REFORESTATION WILL SUCCEED ONLY ON SITES THAT ARE NATURALLY CAPABLE OF SUPPORTING FORESTS, I.E., WHERE THE FINAL STAGE OF NATURAL SUCCESSION IS FOREST. PLANTATIONS SHOULD BE WIDELY SPACED TO AVOID ROOT COMPETITION AND TO PERMIT MOST OF THE PRECIPITATION TO REACH THE SOIL. PLANTINGS SHOULD CONSIST OF NATIVE TREES AND THOSE OF ECONOMIC VALUE (CYPRESS, PINES, CEDAR) INSTEAD OF EXOTICS. REFORESTATION SHOULD BE CARRIED OUT IN STAGES, BEGINNING WITH THE MOST FAVORABLE AREAS, AND THEN EXPANDING TO COVER THE ENTIRE AREA.

OALS/SOIL MOISTURE/REFORESTATION/ARID CLIMATE/ALKALINITY/TOXICITY/ DESICCATION/EROSION/TREES/SITES/LIMITING FACTORS/ROW SPACING/TANGIBLE BENEFITS

32

LEROY LADURIE, E.

1967

HISTOIRE DU CLIMAT DEPUIS L'AN MIL.

FLAMMARION, PARIS. 381 P.

CLIMATIC CHANGE/CLIMATE/HISTORY

33

LOGAN, R.F.

1968

CAUSES, CLIMATES, AND DISTRIBUTION OF DESERTS. IN G.W. BROWN, ED., DESERT BIOLOGY I:21-50.

ACADEMIC PRESS, NEW YORK.

FIVE TYPES OF DESERTS ARE THE SUBTROPICAL DESERTS, COOL COASTAL DESERTS, RAIN SHADOW DESERTS, CONTINENTAL INTERIOR DESERTS AND POLAR DESERTS. SUBTROPICAL DESERTS ARE CAUSED BY WORLDWIDE AIR CIRCULATION THAT ARRIVES NEAR THE EARTH'S SURFACE VERY HOT AND DRY, TOTALLY INCAPABLE OF PRODUCING PRECIPITATION. DESERTS IN THIS CATEGORY INCLUDE THE SAHARA OF NORTH AFRICA, THE DESERTS OF ARABIA, SYRIA, JORDAN, IRAQ, IRAN, AFGHANISTAN, BALUCHISTAN AND PAKISTAN, THE SONORAN DESERT, THE KALAHARI, THE DESERTS OF AUSTRALIA AND SMALL AREAS OF WESTERN ARGENTINA. COOL COASTAL DESERTS ARE ALMOST TOTALLY RAINLESS YET ALWAYS DRENCHED IN MOISTURE. THESE ARE THE NAMIB IN SOUTH WEST AFRICA, THE ATACAMA IN CHILE AND PERU, AND BAJA CALIFORNIA IN MEXICO. RAIN SHADOW DESERTS RESULT FROM AIR CIRCULATION PATTERNS AND RELIEF CONFIGURATIONS THAT CREATE SITUATIONS IN WHICH LEE SIDE AREAS OF MOUNTAINS ARE CONSISTENTLY DEFICIENT IN PRECIPITATION. THESE ARE THE LESSER ANTILLES, HAWAIIAN ISLANDS, HISPANIOLA, MANDALAY PLAINS IN BURMA, CAGAYAN VALLEY IN THE PHILIPPINES, AND SOME INTERIOR DESERTS THAT ARE ALSO CREATED BY THE RAIN SHADOW EFFECT: THE MOJAVE DESERT IN CALIFORNIA, GREAT BASIN DESERTS OF NEVADA AND UTAH, AUSTRALIAN DESERTS AND PATAGONIA DESERT IN ARGENTINA. CONTINENTAL INTERIOR DESERTS, BEING FAR FROM THE MODERATING INFLUENCES OF THE OCEAN, EXHIBIT EXTREMES IN TEMPERATURE RANGES. THESE INCLUDE THE CENTRAL ASIAN DESERTS AND THE DESERTS OF WESTERN UNITED STATES. THE LAST CATEGORY, POLAR DESERTS, RECEIVE VERY LITTLE PRECIPITATION WITH MOISTURE EXISTING IN SOLID FORM. THESE ARE FOUND AT THE ICE CAPS OF ANARCTICA AND GREENLAND AND THE ARCHIPELAGO NORTH OF CANADA.

OALS/DESERTS/CLIMATOLOGY/TOPOGRAPHY/OROGRAPHY/AIR CIRCULATION/AIR MASSES/ FOG DESERTS/POLAR DESERTS/CLIMATIC ZONES/DESERTIFICATION/TEMPERATURE RANGES/ KWIC G 64

34

LOWDERMILK, W.C.

1935

MAN MADE DESERTS.

PACIFIC AFFAIRS 8(4):409-419.

THE AUTHOR INTERPRETS THE FALL OF ANCIENT CIVILIZATIONS IN ARID AND SEMI-ARID AREAS AS BEING DUE TO LAND ABUSE AND RESULTING EROSION AND SOIL DETERIORATION. EXAMPLES ARE NOTED FROM NORTHWEST CHINA, SAHARA, PERUVIAN COAST, MAYAN CIVILIZATION IN MEXICO, ETC. THE HISTORY OF AGRICULTURAL EXPLOITATION IN THE UNITED STATES, CULMINATING IN THE GREAT DUST BOWLS, IS TRACED. THE AUTHOR CONCLUDES THAT IT IS CLEAR THAT MAN AND HIS ANIMALS MAY EXTEND DESERT CONDITIONS, BY PROCESSES OF MAN-INDUCED DESICCATION INTO REGIONS FORMERLY CAPABLE OF SUPPORTING LARGE POPULATIONS. CLIMATE DOES CHANGE, BUT NOT AT THE COMPARATIVELY RAPID RATE OF THE DEGENERATION OF VAST AREAS OF HABITABLE REGIONS.

KWIC DE 12/OALS/DESERTS/ARID LANDS/HISTORY/SOIL EROSION/DUST STORMS/ SOCIAL ASPECTS/GRAZING/VEGETATION/VEGETATION EFFECTS/ARCHAEOLOGY/ DEGENERATION /ANIMAL DAMAGE/PERTURBATION/DESERTIFICATION/DESICCATION

35

LUKER, C.

1956

CONSEQUENCES OF USING ARID LANDS BEYOND THEIR CAPABILITIES. IN G.F. WHITE, ED., THE FUTURE OF ARID LANDS, P. 226-232.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C., PUBLICATION 43.

LAND USE/OVERGRAZING/DEGENERATION/DESERTIFICATION

36

LYDOLPH, P.E.

1957

A COMPARATIVE ANALYSIS OF THE DRY WESTERN LITTORALS.

ASSOCIATION OF AMERICAN GEOGRAPHERS, ANNALS 47:213-230.

EXAMINES MAJOR CONTROLS OF PRECIPITATION AND THEIR MAGNITUDES ALONG THE WESTERN LITTORALS OF SOUTH AMERICA, SOUTHWEST AFRICA, NORTHWEST AFRICA, NORTH AMERICA AND AUSTRALIA. IT IS SUGGESTED THAT THE COASTLINES ARE CLIMATIC CONTROLS CONDUCTIVE TO ARIDITY AND METHODS ARE PRESENTED FOR DETERMINING THE RELATIVE EFFECTS OF ARIDIFYING FACTORS ON TOTAL PRECIPITATION AMOUNTS ALONG THESE COASTS.

BEACHES/ATACAMA/NAMIB-KALAHARI/PERU CURRENT/BENGUELA CURRENT/AUSTRALIA/ SECHURA DESERT/COASTAL DESERTS/CLIMATOLOGY/ATMOSPHERIC PRESSURE/ANTICYCLONES/ ATMOSPHERIC CIRCULATION/WATER TEMPERATURE/TEMPERATURE INVERSION/METEOROLOGICAL DATA/SOUTH AMERICA/AFRICA/NORTH AMERICA/PRECIPITATION(ATMOSPHERIC)

37

MABBUTT, J.A.

1969

PROBLEMS IN THE CLIMATIC GEOMORPHOLOGY OF ARID LANDS.

ANNALS OF ARID ZONE 8(2):209-224. SWRA W71-00700.

TWO MAJOR PROBLEMS OF DESERT STUDIES ARE: 1) THE NATURE OF THE DEVELOPMENTAL PROCESSES OF ARID ZONE LANDFORMS; 2) DEFINITIVE DESCRIPTIONS OF ARID AND SEMIARID REGIONS. EARLY INVESTIGATORS FELT THAT DESERTS WERE STATIC REGIONS CONSISTING OF RELICT TOPOGRAPHICAL FORMS. GRADUALLY, THE IMPORTANCE OF WIND AND WATER, PRIMARILY AS WEATHERING AGENTS, HAS COME TO BE RECOGNIZED. IT IS THE AUTHOR'S VIEW THAT THE PHYSIOCHEMICAL EFFECTS OF WATER ARE AT LEAST AS IMPORTANT AS THE PHYSICAL EFFECTS, AND THAT WIND AND WATER ARE COMPLEX INTERACTING AGENTS WHOSE EFFECTS DECREASE TOWARD THE ARID CORE AREAS. A NUMBER OF CHARACTERISTIC LANDFORM PHENOMENA ARE DESCRIBED, BUT THEIR USEFULNESS AS ARID ZONE MORPHOCLIMATIC INDICES HAS BEEN LIMITED. ADDITIONALLY, VEGETATION, RAINFALL AND THE PRESENCE OF SAND DUNES ARE EXAMININED IN TERMS OF THE DELIMITATIONS AND SUBDIVISIONS OF ARID REGIONS, BUT NONE ARE TRULY DEFINITIVE. THIS ARGUMENT IS BUTTRESSED BY DESCRIPTIONS OF A WIDE VARIETY OF WARM ARID CLIMATES, MANY OF WHICH DIFFER GREATLY IN CRUCIAL DESCRIPTIVE PARAMETERS. THERE ARE SHORT DISCUSSIONS OF PAST CLIMATIC CHANGES AS REVEALED BY PALEOFORMS AND THE INFLUENCES OF ANTHROPOGENIC FACTORS. (OALS)

OALS/WEATHERING/ARID LANDS/CLIMATIC ZONES/SEMIARID CLIMATE/SANDS/ RAINFALL/GEOLOGY/EOLIAN SOILS/WIND EROSION/PALEOCLIMATOLOGY/DESERTS/ DUNES /CLIMATIC GEOMORPHOLOGY/LANDFORMS/CLIMATIC CHANGE

38

MCKEE, E.D./BREED, C.S./HARRIS, L.F.

1973

A STUDY OF MORPHOLOGY, PROVENANCE AND MOVEMENT OF DESERT SAND SEAS IN AFRICA, ASIA, AND AUSTRALIA. IN SYMPOSIUM ON SIGNIFICANT RESULTS OBTAINED FROM ERTS-1, TECHNICAL PRESENTATIONS 1(A):291-303.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION SP-327.

AFRICA/AUSTRALIA/CENTRAL ASIA/SANDS/DESERTS/GEOMOPPHOLOGY/SAND DUNES/ REMOTE SENSING/AERIAL PHOTOGRAPHY/SPACE RECONNAISSANCE/SATELLITES(ARTIFICIAL)

39

MILLER, J./LEOPOLD, L.B.

1953

THE USE OF SOILS AND PALEOSOLS FOR INTERPRETING GEOMORPHIC AND CLIMATIC HISTORY OF ARID REGIONS. IN DESERT RESEARCH, INTERNATIONAL SYMPOSIUM HELD IN JERUSALEM MAY 7-14, 1952, PROCEEDINGS, P. 453-462. SPONSORED BY THE RESEARCH COUNCIL OF ISRAEL AND UNESCO.

RESEARCH COUNCIL OF ISRAEL, SPECIAL PUBLICATION 2.

CLIMATE/CLIMATIC CHANGE/SOIL TYPES/PALEOSOLS/GEOMORPHOLOGY

40

MITCHELL, J.M., JR./KISS, E.

1964

ANNOTATED BIBLIOGRAPHY ON CLIMATIC CHANGES: GENERAL WORKS-THEORIES; AND ANNOTATED BIBLIOGRAPHY ON CLIMATIC CHANGES IN HISTORICAL TIMES: SYNTHETIC STUDIES.

METEOROLOGICAL AND GEOASTROPHYSICAL ABSTRACTS 15(11):2236-2284; (12):2434-2478.

THESE ARE TWO SUPPLEMENTARY COMPILATIONS ON CLIMATIC CHANGES: THE FIRST EMPHASIZES THE INSTRUMENTAL AND RECENT HISTORICAL PERIODS (I.E., GENERALLY WITHIN THE PAST MILLENIUM), AND THE SECOND DEALS WITH INTERRELATIONSHIPS BETWEEN FLUCTUATIONS OF DIFFERENT CLIMATIC VARIABLES AND ATMOSPHERIC CIRCULATION. INCLUDED ARE BOOKS, MONOGRAPHS, REVIEW ARTICLES, CONFERENCE SUMMARIES, ETC. EMPHASIS IS PLACED ON MATERIAL PUBLISHED SINCE 1950. EACH BIBLIOGRAPHY CONTAINS A DETAILED OUTLINE OF CONTENTS WHICH IS STRUCTURED AS A SUBJECT INDEX.

OALS/BIBLIOGRAPHIES /PALEOCLIMATOLOGY/SOLAR RADIATION/METEOROLOGY/ ATMOSPHERIC CIRCULATION/OCEAN CURRENTS/PRECIPITATION(ATMOSPHERIC)/ TEMPERATURE RANGES/GLACIERS/WATER LEVEL FLUCTUATIONS /CLIMATIC-VEGETAL RELATIONSHIPS /ARIDITY/CLIMATIC CHANGE/GEOPHYSICS/GLACIERS/CLIMATIC GEOMORPHOLOGY/SEASONAL

41

MONOD, T.

1959

PARTS RESPECTIVES DE L'HOMME ET DES PHENOMENES NATURELS DANS LA DEGRADATION DU PAYSAGE ET LE DECLIN DE CIVILISATIONS A TRAVERS LE MONDE MEDITERRANEEN LATO SENSU, AVEC LE DESERTS OU SEMI-DESERTS ADJACENTS AU COURS DES DERNIERS MILLENAIRES.

INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES, TECHNICAL MEETINGS, 7TH, ATHENS, 1958, PROCEEDINGS AND PAPERS 7(1):31-69.

IL NE SEMBLE PAS QUE DEPUIS 2000 ANS LES REGIONS EN CAUSE AIENT CONNU DE VERITABLE CHANGEMENT DE CLIMAT; LES EXEMPLES DE DESERTIFICATION HISTORIQUE RELEVERONT DE L'ACTIVITE HUMAINE (DESTRUCTION DE LA COUVERTURE VEGETALE, ABONDANCE DES INSTALLATIONS HYDRAULIQUES ANCIENNES, ETC.).

CLIMATIC CHANGE/DESERTIFICATION/ENVIRONMENTAL IMPACT/HISTORY/HUMANS

42

MONOD, T.

1973

LES DESERTS.

HORIZONS DE FRANCE, PARIS. 248 P.

CET OUVRAGE D'ENSEMBLE CONSTITUE EN QUELQUE SORTE UNE INTRODUCTION A LA CONNAISSANCE DES DESERTS DU GLOBE (CLIMAT, PHYSIOGRAPHIE, FAUNES ET FLORES, L'HOMME AU DESERT, APERCUS REGIONAUX; BIBLIOGRAPHIE CLASSEE).

DESERTS/PHYSICAL GEOGRAPHY/CLIMATE/FLORA/ANIMAL POPULATIONS/HUMANS/ BIBLIOGRAPHIES

43

NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D.C., COMMITTEE ON ATMOSPHERIC SCIENCES

1973

WEATHER AND CLIMATE MODIFICATION, PROBLEMS AND PROGRESS.

SAME AS AUTHOR. 258 P.

AREAS DELINEATED FOR FURTHER RESEARCH INCLUDE: 1) FOG SUPPRESSION, ESPECIALLY IN RELATION TO AIRPORT OPERATIONS, 2) PRECIPITATION MODIFICATION, DESIGNED PARTICULARLY TO INCREASE PRECIPITATION OVER WATERSHEDS, 3) MITIGATION OF SEVERE STORMS SUCH AS HURRICANES, AND 4) INADVERTENT WEATHER/CLIMATE MODIFICATION EFFECTS.

OALS/WEATHER MODIFICATION/ARTIFICIAL PRECIPITATION/STORMS/FOG/ ENVIRONMENTAL ENGINEERING/WATER YIELD IMPROVEMENT

44

OPPENHEIMER, H.R.

1960

ADAPTATION TO DROUGHT: XEROPHYTISM. IN PLANT-WATER RELATIONSHIPS IN ARID AND SEMI-ARID CONDITIONS, REVIEW OF RESEARCH.

UNESCO, PARIS. ARID ZONE RESEARCH 15:105-138.

CONSIDERS THE ABILITY OF PLANTS TO SURVIVE UNDER ARIDITY ARISING FROM VARIOUS CAUSES, THE MEANS AND PROCESSES BY WHICH SURVIVAL IS OBTAINED, AND OTHER ASPECTS OF THE SUBJECT. BIBLIOGRAPHY OF 264 SELECTED TITLES.

DROUGHTS/XEROPHYTES/BIBLIOGRAPHIES/PLANTS/DROUGHT TOLERANCE/ADAPTATION/ CLIMATIC-VEGETAL RELATIONSHIPS/ENVIRONMENTAL EFFECTS

45

OSTROM, C.E./READ, R.A.

1968

SHELTERBELTS AND WINDBREAKS. IN WORLD SYMPOSIUM ON MAN-MADE FORESTS AND THEIR INDUSTRIAL IMPORTANCE, CANBERRA, 1967, P. 463-494.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. PAPER FO/MMF:67.

WINDBREAKS/SHELTERBELTS/ENVIRONMENTAL ENGINEERING

46

OTTERMAN, J.

1974

BARING HIGH-ALBEDO SOILS BY OVERGRAZING: A HYPOTHESIZED DESERTIFICATION MECHANISM.

SCIENCE 186:531-533.

OBSERVATIONS ARE REPORTED OF HIGH-ALBEDO SOILS DENUDED BY OVERGRAZING WHICH APPEAR BRIGHT, IN HIGH CONTRAST TO REGIONS COVERED BY NATURAL VEGETATION. MEASUREMENTS AND MODELING SHOW THAT THE DENUDED SURFACES ARE COOLER, WHEN COMPARED UNDER SUNLIT CONDITIONS. THIS OBSERVED 'THERMAL DEPRESSION' EFFECT SHOULD, ON THEORETICAL GROUNDS, RESULT IN A DECREASED LIFTING OF AIR NECESSARY FOR CLOUD FORMATION AND PRECIPITATION, IN TURN LEADING TO REGIONAL CLIMATIC DESERTIFICATION. (AUTHOR)

ALBEDO/OVERGRAZING/SOIL TEMPERATURE/PRECIPITATION(ATMOSPHERIC)/REFLECTANCE/ WEATHER MODIFICATION/DESERTIFICATION

47

PALMER, W.C.

1965

METEOROLOGICAL DROUGHT.

U.S. WEATHER BUREAU, WASHINGTON D.C., RESEARCH PAPER 45. 58 P.

DROUGHTS/METEOROLOGY

48

PALMER, W.C./DENNY, L.M.

1971

DROUGHT BIBLIOGRAPHY.

U.S. DEPARTMENT OF COMMERCE, WASHINGTON, D.C., NOAA-TECHNICAL MEMORANDUM EDS-20. 248 P. AVAILABLE NTIS AS COM-71-00937.

THIS COMPILATION OF REFERENCES ON DROUGHT COVERS THE LITERATURE THROUGH 1968. THE BIBLIOGRAPHY CONSISTS OF REFERENCES, WITH ABSTRACTS WHERE AVAILABLE, TO LITERATURE ON THE SUBJECT OF AGRICULTURAL, HYDROLOGIC, AND METEOROLOGICAL DROUGHT. A SHARP LINE IS DRAWN TO EXCLUDE MATERIAL THAT MAY BE RELATED TO, BUT NOT SPECIFICALLY PERTINENT TO DROUGHT. BASIC TO THIS APPROACH WAS THE CONVICTION THAT DROUGHT IS A CONDITION OF PROLONGED AND ABNORMAL DRYNESS. THUS, MOST PAPERS DEALING WITH DESERT OR ARID ZONES ARE EXCLUDED BECAUSE DRYNESS IS THE NORMAL STATE OF SUCH REGIONS. (AUTHORS)

OALS/DROUGHTS/BIBLIOGRAPHIES/ABSTRACTS/AGRICULTURE/HYDROLOGY/METEOROLOGY/CLIMATIC CHANGE/CLIMATOLOGY

49

PATON, J.R./WILLIAMS, M.A.J.

1972

THE CONCEPT OF LATERITE.

ASSOCIATION OF AMERICAN GEOGRAPHERS, ANNALS 62(1):42-56.

CRITICAL REVIEW, CASTING DOUBT UPON THE VALUE OF LATERITE IN PALAEO-CLIMATIC AND CHRONO-STRATIGRAPHIC STUDIES.

PALEOCLIMATOLOGY/STRATIGRAPHY/GEOCHRONOLOGY

50

PEEL, R.F.

1966

THE LANDSCAPE IN ARIDITY.

INTSTUTE OF BRITISH GEOGRAPHERS, TRANSACTIONS AND PAPERS, PUBLICATION 38. 23 P.

THE PAPER REVIEWS VARIOUS PROBLEMS INHERENT IN THE GEOMORPHOLOGICAL INTERPRETATION OF THE EARTH'S ARID LANDSCAPES. THESE STEM FROM TWO MAIN FACTORS, THE VARIABILITY OF THE PAST CLIMATIC CONDITIONS IN THE ARID ZONES, AND CONSIDERABLE DEFICIENCIES IN OUR KNOWLEDGE OF THE CHARACTER AND RATES OF THE ARID PROCESS OPERATING TODAY. A BRIEF REVIEW OF TERRESTRIAL ARIDITY THROUGHOUT GEOLOGICAL TIME, AND OF THE GEOLOGICAL CRITERIA OF PAST ARIDITY, IS FOLLOWED BY A SUMMARY OF CURRENT IDEAS ON THE CLIMATIC HISTORY OF THE SAHARA AND OF THE EVIDENCE UPON WHICH THESE ARE BASED. THE AUTHOR FINDS NO PROGRESSIVE CLIMATIC DETERIORATION IN THE SAHARA. FLUCTUATIONS IN TOPOGRAPHIC PHENOMENA IN THE SENSITIVE MARGINAL BELTS SEEM BETTER EXPLAINED BY QUITE DIFFERENT FACTORS, NOT THE LEAST BEING THE INTERFERENCE OF MAN AND HIS GRAZING ANIMALS. IN THE REALM OF WIND-ACTION THE MAIN PROBLEMS ARE THE MODES OF ORIGIN OF THE GREAT ERGS AND SAND-SEAS, THE ORIENTATION PATTERNS OF MAJOR DUNE SYSTEMS, AND THE GEOMORPHOLOGICAL POTENTIALITIES OF WIND-EROSION.

KWIC DE 11/OALS/ARID LANDS/ARID CLIMATE/GEOMORPHOLOGY/SAND DUNES/PALEOCLIMATOLOGY/CLIMATOLOGY/GRAZING/DUNES/EROSION/WEATHERING/DESERTS/WIND EROSION/GEOLOGIC TIME/CLIMATIC GEOMORPHOLOGY/WIND ACTION/ARIDITY/DESERTIFICATION/SAHARA/CLIMATIC CHANGE/ERGS

51

PETERSON, R.A.

1970

LAND UTILIZATION IN NONIRRIGATED AREAS. IN H.E. DREGNE, ED., ARID LANDS IN TRANSITION, P. 435-449.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C., PUBLICATION 90. SWRA W71-08453.

THE MAJOR FORM OF LAND UTILIZATION IN MOST ARID REGIONS IS ANIMAL PRODUCTION THROUGH GRAZING. POPULATION INCREASES IN MOST ARID LANDS IMPLY THAT BOTH SOCIAL AND RESOURCE UTILIZATION FACTORS MUST BE REVISED. ARID ZONES PRESENT SEVERAL UNIQUE FACTORS THAT RENDER THEIR DEVELOPMENT DIFFICULT: 1) INTENSITY OF USE IS LOW IN COMPARISON WITH MORE FAVORED REGIONS, AND MISGUIDED ATTEMPTS AT OVERINTENSIFICATION MORE QUICKLY LEAD TO ENVIRONMENTAL DEGRADATION; 2) CAPITAL INPUTS YIELD RELATIVELY LOW INCREMENTS IN PRODUCTION, THEREBY DISCOURAGING INFLOW OF NEW CAPITAL; 3) INTENSIFICATION MUST BE HORIZONTAL RATHER THAN VERTICAL, OWING TO LIMITED ABSORPTIVE CAPACITY; 4) LAND USES HAVE BEEN POORLY INTEGRATED AND MULTIPLE USAGE HAS BEEN LIMITED; 5) MOST COUNTRIES WITH ARID ZONES HAVE BEEN RELUCTANT TO INVEST IN RESEARCH AND DEVELOPMENT, PREFERRING MORE INTENSIVE EXPLOITATION OF THEIR HUMID REGIONS. A NUMBER OF DETAILED SUGGESTIONS ARE ADVANCED, INVOLVING INSTITUTIONAL MECHANISMS, RESOURCE EVALUATION, EDUCATION, RESEARCH, INSTITUTIONAL REORGANIZATION, CAPITAL INCENTIVES AND WATER DEVELOPMENT. (OALS)

LAND TENURE/ARID LANDS/LAND USE/GRAZING/ECONOMIC DEVELOPMENT/ECONOMIC GEOGRAPHY/ENVIRONMENTAL EFFECTS/CONSERVATION/SOCIAL ASPECTS/ECOSYSTEMS/LAND MANAGEMENT/DRY FARMING/OALS

52

PETROV, M.P.

1971

SAND STABILIZATION METHODS IN ARID LANDS; PROTECTION OF AGRICULTURAL AND SETTLEMENT AREAS. IN W.G. MCGINNIES, B.J. GOLDMAN AND P. PAYLORE, EDS., FOOD, FIBER AND THE ARID LANDS, P. 355-368.

UNIVERSITY OF ARIZONA PRESS, TUCSON. SWRA W72-03671.

MOBILE SANDS, OFTEN THE RESULT OF MAN'S ACTIVITIES, ARE SOMETIMES SERIOUSLY DAMAGING TO THE ECONOMY OF AN AREA. WORLDWIDE EXPERIENCE IN ATTEMPTING TO COPE WITH THE PROBLEM HAS RESULTED IN A NUMBER OF MEANS TO ACHIEVE STABILIZATION, INCLUDING VEGETATIVE AND PHYSICOCHEMICAL. THIS PAPER DESCRIBES THREE MAJOR TYPES OF SANDY AREAS AND EIGHT MAJOR GROUPS OF VEGETATION SITES, INCLUDING SEMIARID WHERE TREE-SHRUBS AND PERENNIAL ACHIEVE THE BEST RESULTS, AND ARID WHERE LOW SHRUBS AND PERENNIAL AND ANNUAL GRASSES MAY BE USED IF PROTECTED BY WINDBREAKS. FOR EXTREMELY ARID AREAS, PHYSIOCOCHEMICAL RECLAMATION IS MORE SUCCESSFUL USING CLAY, BITUMEN, RUBBER, POLYMERS, AND OTHER COVERS. RESEARCH AND DEVELOPMENT WORK STILL NECESSARY IS DETAILED.

OALS/SAND CONTROL/DESERTIFICATION/SOIL STABILIZATION/SYNTHETIC ELASTOMERS/VEGETATION ESTABLISHMENT /REVEGETATION/SHELTERBELTS

53

PETROV, M.P.

1973

PUSTYNI ZEMNOGO SHARA (DESERTS OF THE WORLD).

NAUKA, LENINGRAD. 435 P.

A SUMMARY OF CONTEMPORARY CONCEPTS OF NATURAL FEATURES AND RESOURCES OF DESERTS AND SEMI-DESERTS BY CONTINENTS, WITH COMPARATIVE CHARACTERISTICS. GENERAL PRINCIPLES OF THE MOVEMENT OF SANDS AND THE GENESIS OF EOLIAN RELIEF ARE INVESTIGATED, AND THE ADAPTATION OF PLANTS AND ANIMALS TO DESERT HABITATS. AN ATTEMPT IS MADE TO INTERPRET THE FUTURE OF WORLD DESERTS.
[A 1976 TRANSLATION INTO ENGLISH WAS PUBLISHED BY HALSTED PRESS, N.Y.]

TOPOGRAPHIC FEATURES/SANDS/WIND ACTION/EOLIAN SOILS/GEOMORPHOLOGY/ADAPTATION/PLANT ECOLOGY/ANIMAL ECOLOGY/DESERT ANIMALS/DESERT PLANTS

54

PETROV, M.P.

1974

MIROVOY OPYT OBLESENIYA I ZAKREPLENIYA PODVIZHNIKH PESKOV V PUSTYNYAKH ZEMNOGO SHARA (WORLDWIDE EXPERIENCE IN AFFORESTATION AND FIXATION OF SHIFTING SANDS IN WORLD DESERTS).

LENINGRAD UNIVERSITY PRESS. 48 P.

DESCRIPTION OF BASIC SHIFTING SAND PHYTORECLAMATION AND FIXATION WITH BINDING SUBSTANCES. METHODS FOR THE STUDY OF FOREST GROWING CONDITIONS AND AGRO-TECHNICAL METHODS. THE LIST OF SAND FIXING PLANTS FOR VARIOUS EARTH DESERTS AND THE BIBLIOGRAPHY OF BASIC WORKS ON THE AFFORESTATION AND FIXATION OF SANDS IN ARID AREAS, BY CONTINENT AND SUBCONTINENT, ARE OF PARTICULAR INTEREST.

SANDS/SAND CONTROL/AFFORESTATION/FORESTRY/DESERT PLANTS/BIBLIOGRAPHIES

55

RAIKES, R.L.

1967

WATER, WEATHER AND PREHISTORY.

JOHN BAKER, LONDON. 208 P.

A HYDROLOGIST EXAMINES THEORIES OF THE IMPACT OF WATER AND WEATHER ON EARLIER CULTURES, DISCOUNTING THEORIES RESTING ON CLIMATIC CHANGE AND EXPLAINING PAST PROBLEMS IN ARID SOCIETIES ON THE BASIS OF HUMAN INTERACTION WITH KNOWN FACTS AND PRINCIPLES OF ECOLOGY, SOILS SCIENCE, HYDROLOGY AND GEOLOGY. SINCE ABOUT 7000 B.C., CLIMATE WORLDWIDE HAS BEEN MUCH AS SCHOLARS FIND IT TODAY. CLIMATE AT SPECIFIC SITES, HOWEVER, IS SUBJECT TO GREAT VARIABILITY OR FLUCTUATIONS. FROM THIS HYPOTHESIS, THE AUTHOR EXPLORES THE FATE OF VARIOUS NORTH AFRICAN, MIDDLE EASTERN, AND INDIAN CIVILIZATIONS AND MAN'S IMPACT ON THE ENVIRONMENT. NUMEROUS EXAMPLES ARE OFFERED OF THE CONSEQUENCES OF SUCH HUMAN ACTIVITES AS DEFORESTATION, LARGE-SCALE GRAZING OF STOCK, TERRACING, DIVERSION OF WATER FOR IRRIGATION, AND THE SINKING OF WELLS FOR DRINKING WATER. A PLEA IS MADE FOR TRULY INTERDISCIPLINARY STUDIES IN THE FUTURE.

HISTORY/WATER RESOURCES/WEATHER/HYDROLOGY/PALEOCLIMATOLOGY/ARCHAEOLOGY/GEOMORPHOLOGY/HUMANS/CLIMATIC CHANGE/ECOLOGY

56

BATHJENS, C.

1968

SOME IMPORTANT PRINCIPLES OF ANTHROPOGENIC GEOMORPHOLOGY IN ARID CLIMATES.

INTERNATIONAL GEOGRAPHICAL CONGRESS, 21ST, DELHI, 1968, SELECTED PAPERS 1:497-499.

THE AUTHOR BELIEVES DESICCATION IS MORE FREQUENTLY A CONSEQUENCE OF HUMAN ACTIVITIES THAN CLIMATIC CHANGE, AS MAN INFLUENCES VEGETATION, SOILS, AND THE HYDROLOGICAL BALANCE. EVEN GEOMORPHOLOGICAL PROCESSES, THOUGH NOT YET STUDIED IN DEPTH IN RELATION TO THE CONTRIBUTION OF IRRIGATION PRACTICES IN ARID AREAS, CAN BE AND ARE BEING SO CHANGED BY THESE HUMAN ACTIONS. HE DEMONSTRATES SOME OF THE PROBLEMS WITH EXAMPLES FROM THE THAR AND OTHER ARID AND SEMIARID AREAS.

OALS/THAR DESERT/GEOMORPHOLOGY/DESERTIFICATION/CLIMATIC CHANGE/ IRRIGATION PRACTICES

57

BEITAN, C.H./GREEN, C.R.

1968

APPRAISAL OF RESEARCH ON WEATHER AND CLIMATE OF DESERT ENVIRONMENTS. IN W.G. MCGINNIES, B.J. GOLDMAN AND P. PAYLORE, EDS., DESERTS OF THE WORLD, P. 19-92.

UNIVERSITY OF ARIZONA PRESS, TUCSON. SWRA W69-09207.

THIS PAPER IS A SURVEY OF WHAT IS KNOWN ABOUT THE WEATHER AND CLIMATE OF THE DESERTS OF THE WORLD AND AN EVALUATION OF RESEARCH NEEDS. CLIMATIC BRIEFS ARE PRESENTED FOR THE MAJOR WORLD DESERTS. THESE INCLUDED MAJOR REFERENCES FOR CLIMATIC DATA AND FOR SYNOPTIC CLIMATOLOGY. DESERT STORMS AND UPPER-AIR CIRCULATIONS ARE EACH DISCUSSED. THE CONCEPT OF ARIDITY IS CONSIDERED IN RELATION TO THEORETICAL AND EMPIRICAL MEASUREMENTS OF WATER USE, OASIS EFFECT, POTENTIAL EVAPOTRANSPIRATION, CLASSIFICATION OF CLIMATE, INDICES OF ARIDITY, AND CLIMATIC ANALOGS. OTHER TOPICS TREATED ARE WEATHER MODIFICATION, MICROCLIMATE, RADIATION, BIBLIOGRAPHIES AND DEPOSITORIES. THE LACK OF A SATISFACTORY SYSTEM FOR DETERMINING WATER NEED AND WATER USE, AND FOR EXPRESSING ARIDITY IN THESE TERMS IS EMPHASIZED. THE EMPIRICAL EQUATIONS OF PENMAN AND BUDYKO ARE SUGGESTED TO BE THE MOST PRACTICAL METHODS OF ESTIMATING WATER NEED. IF ARIDITY AND QUANTITATIVE ESTIMATES OF WATER NEED ARE TO BE DEFINED AND DETERMINED IN TERMS OF THESE EQUATIONS, ORDINARILY UNAVAILABLE CLIMATOLOGICAL DATA SUCH AS RADIATION MEASUREMENTS, CLOUD COVER AND VAPOR PRESSURE WILL BE REQUIRED. MORE FIELD STUDIES ARE NEEDED TO DETERMINE THE VARIATIONS OF CLIMATE THAT OCCUR ON THE MICRO- AND MESO-SCALE OF DISTANCE. THE LEVEL OF CURRENT RESEARCH AND THE AUTHORITIES ARE DISCUSSED FOR EACH DESERT REGION OF THE WORLD. (OALS)

OALS/DESERTS/CLIMATIC DATA/WEATHER DATA/SYNOPTIC CLIMATOLOGY/ARIDITY/ WEATHER MODIFICATION/STORMS/PENMAN, H.L./BUDYKO, M.I./ PRECIPITATION(ATMOSPHERIC)/AIR CIRCULATION/ENVIRONMENTAL ENGINEERING

58

RINEY, T.A.

1971

WILDLIFE AND NOMADIC STOCKS IN SEMI-ARID LANDS.

LAND REFORM, LAND SETTLEMENT AND COOPERATIVES 1:27-37.

THE ENTIRE QUESTION OF NOMADS, WILDLIFE AND DRY LANDS IS ONLY ONE ASPECT OF THE VERY MUCH LARGER GLOBAL MATTER OF THE STABILIZATION OF THE MARGINAL LANDS OF THE WORLD, AND THEIR GRADUAL CONVERSION TO SOME FORM OF PRODUCTIVE USE. THE DESIRABILITY MUST BE CONSIDERED OF ARRESTING UNSATISFACTORY PRESENT FORMS OF USE AND OF SEARCHING FOR A VARIETY OF ALTERNATIVES. IN FUTURE, WILDLIFE MAY LARGELY REPLACE THE NOMADIC HERDS AND OTHER TYPES OF DOMESTIC ANIMAL USE ON THE DRY LANDS NOW UTILIZED MAINLY BY NOMADS. TECHNOLOGICALLY THERE IS COMPETENCE TO BRING ABOUT THESE CHANGES IN MANAGEMENT AND MARKETING, BUT TIME AND FURTHER RESEARCH ARE ESSENTIAL.

OALS/GRAZING/NOMADS/LAND RECLAMATION/LAND USE/WILDLIFE MANAGEMENT/ DESICCATION/ECONOMIC DEVELOPMENT/LIVESTOCK/SEMIARID CLIMATE

59

ROSENBURG, N.J.

1967

THE INFLUENCE AND IMPLICATIONS OF WINDBREAKS ON AGRICULTURE IN DRY REGIONS. IN GROUND LEVEL CLIMATOLOGY.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON D.C., PUBLICATION 86: 327-349.

WINDBREAKS/AGRICULTURE/ENVIRONMENTAL ENGINEERING

60

RUSSELL, C.S./AREY, D.G./KATES, R.W.

1970

DROUGHT AND WATER SUPPLY.

JOHNS HOPKINS PRESS, BALTIMORE. 232 P.

DROUGHTS/WATER SOURCES

61

SALLOUM, N.M., AL-

1973

FATIGUE CHARACTERISTICS OF AN ASPHALT STABILIZED DUNE SAND.

UNIVERSITY OF ARIZONA (PH.D. DISSERTATION). 344 P.

SAMPLES OF ASPHALT STABILIZED DUNE SAND ROAD PAVEMENT WERE MACHINE TESTED TO FAILURE UNDER CONTROLLED REPETITIVE LOADING IN ORDER TO DETERMINE FATIGUE CHARACTERISTICS. REPEATED STRESSING MAY REFLECT ACTUAL ROAD CONDITIONS BETTER THAN THE MORE COMMON STATIC LOAD TESTING. DUNE SAND WAS CHOSEN FOR STUDY BECAUSE OF ITS GREAT AREAL EXTENT IN SOME DESERTS, OFTEN FAR FROM OTHER ROAD CONSTRUCTION MATERIAL SOURCES. EXPERIMENTAL VARIABLES INCLUDED ASPHALT CONTENT, TEMPERATURE, INITIAL SUPPORT PRESSURE, RADIUS OF LOADED AREA, AND SPECIMEN THICKNESS. RELATIONSHIPS BETWEEN THESE VARIABLES, AND OPTIMUM PAVEMENT PARAMETERS FOR MAXIMUM FATIGUE LIFE WERE EMPIRICALLY DERIVED. BASED ON THESE RESULTS, A TWO-LAYER PAVEMENT DESIGN IS SUGGESTED. THE DATA INDICATE THAT DUNE SAND-ASPHALT ROADS CAN RESIST ONLY LIGHT TO MEDIUM TRAFFIC.

OALS/ASPHALT/DUNES/SANDS/TRANSPORTATION/ENVIRONMENTAL ENGINEERING/ ANALYTICAL TECHNIQUES/TEMPERATURE/TRAFFICABILITY/INSTRUMENTATION/ROAD CONSTRUCTION/ERGS/SAND DUNES/SAND DESERTS/DESERTS/SOIL STABILIZATION/ SAND CONTROL/SURFACE PROPERTIES

62

SAUER, C.O.

1955

THE AGENCY OF MAN ON THE EARTH. IN W.L. THOMAS, JR., ED., MAN'S ROLE IN CHANGING THE FACE OF THE EARTH, P. 49-69.

UNIVERSITY OF CHICAGO PRESS, CHICAGO.

A REVIEW OF THE PROGRESSIVE INTENSITY OF MAN'S ACTIVITIES IN ALTERING PREVIOUSLY ESTABLISHED ECOLOGICAL BALANCES. PLEISTOCENE AND POST PLEISTOCENE CLIMATE ARE EVALUATED, AND PROBLEMS OF DETERMINING PAST CLIMATES ARE OUTLINED. MAN'S USE OF FIRE WAS GREAT, IN MAIN BEING RESPONSIBLE FOR THE ORIGIN AND PRESERVATION OF GRASSLANDS. THE ORIGIN OF PEASANT AND PASTORAL WAYS IS TRACED AND THE SPREAD OUTLINED. SHIFTING AGRICULTURE HAS SEVERAL BENEFITS, ECOLOGICALLY, OVER PLOW AGRICULTURE. AS FOR DESERTIFICATION IN NORTH AFRICA, THE AUTHOR DOUBTS CHANGES IN THE PATTERN OF ATMOSPHERE CIRCULATION WITHIN THE TIME OF AGRICULTURE AND PASTORAL OCCUPATION. LARGELY, AND POSSIBLY WHOLLY, THE DETERIORATION OF THE BORDERS OF THE DRY LANDS MAY HAVE BEEN CAUSED BY ADVERSE, CUMULATIVE EFFECTS OF MAN'S ACTIVITIES. DESERTIFICATION OF PARTS OF THE NAVAJO INDIAN RESERVATION BY OVERGRAZING OF SHEEP IS A SIGN THAT THE NEW WORLD COULD FOLLOW THE OLD IF OVERGRAZING IS INTENSIFIED BY DROUGHTS. THE COLONIZATION OF THE NEW WORLD IS TRACED, BOTH IN NORTH AMERICA AND LATIN AMERICA. EFFECTS OF SUCH CROPS AS TOBACCO AND COTTON HAVE BEEN GREAT. NEEDS FOR LAND AND TIMBER HAVE SPREAD THE EFFECTS OF CHANGE. THE AUTHOR SUGGESTS THAT MODERN TECHNOLOGICAL SOCIETY IS IN AN ECOLOGICALLY PRECARIOUS POSITION AND THREATENS TO SUBVERT THE SO CALLED UNDERDEVELOPED COUNTRIES INTO THE SAME POSITION.

KWIC DE 10/OALS/ARID LANDS/SOCIAL ASPECTS/AGRICULTURE/GRAZING/BURNING/ DOMESTIC ANIMALS/ENVIRONMENTAL EFFECTS/GRASSES/HUMANS/HISTORY/NORTH AMERICA/CULTURAL GEOGRAPHY/SOIL EROSION/NORTH AFRICA/PERTURBATION/ PALEOCLIMATOLOGY/BIOGEOGRAPHY/DESERTIFICATION/SOUTH AMERICA

63

SCHNEIDER, S.T./MESIROV, L.E.

1976

THE GENESIS STRATEGY.

PLENUM, NEW YORK.

INTENDED FOR A POPULAR AUDIENCE, THIS BOOK SUMMARIZES BOTH THE HISTORY AND THEORY OF CLIMATE TO ILLUSTRATE ITS VARIABILITY AND THE COMPLEXITY OF THE MECHANISMS THAT CONTROL IT. THE AUTHOR PROPOSES A STRATEGY FOR THE MODERN WORLD THAT WOULD INCLUDE LARGE GRAIN RESERVES AND SIMILAR POLICIES TO MAINTAIN 'MARGINS OF SAFETY' IN THE FACE OF POTENTIALLY ADVERSE CLIMATIC CHANGES, WHETHER OF NATURAL OR HUMAN ORIGIN. HE CALLS ATTENTION TO THOSE AREAS ON WHICH THE WORLD'S TRADITIONAL DEPENDENCE FOR ADEQUATE FOOD MAY BE JEOPARDIZED BY CLIMATIC FLUCTUATIONS THAT INDUCE DROUGHTS AND OTHER MANIFESTATIONS OF ADVERSE WEATHER. HIS FOCUS ON THE POTENTIAL IMPACT OF CLIMATE CHANGE ON WORLD FOOD SUPPLIES IS ILLUSTRATED BY EXAMPLES FROM THE USSR, THE SAHEL, AND CANADA AND THE U.S.

CLIMATOLOGY/ENVIRONMENTAL EFFECTS/CLIMATIC CHANGE/FOOD SUPPLY/PLANNING/ VARIABILITY(ENVIRONMENTAL)

64

SEARS, P.B.

1959

DESERTS ON THE MARCH. 3D ED., REV.

UNIVERSITY OF OKLAHOMA PRESS, NORMAN. 178 P.

THIS POPULAR ACCOUNT OF MAN'S MISUSE OF THE LAND AND FAILURE TO UNDERSTAND ITS ECOLOGY CENTERS AROUND THE HISTORICAL DEVELOPMENT OF LAND USE IN THE UNITED STATES. THE CUTTING OF FOREST, FARMING OF COTTON, PLOWING OF PRAIRIES, POLLUTING OF RIVERS, OVERGRAZING AND GENERAL DISREGARD FOR THE WELFARE OF THE LAND ARE SHOWN TO BE RELATED TO FLOODS, MUDSLIDES, DUST STORMS, EROSION AND OTHER NATURAL CALAMITIES. THE AUTHOR ARGUES THAT ONLY THROUGH A BROAD ECOLOGICAL UNDERSTANDING OF THE ENVIRONMENT AND MAN'S RELATIONSHIP TO IT COUPLED WITH MORAL COMMITMENT IN THE EMPLOYMENT OF TECHNICAL RESOURCES AND IN OUR WAY OF LIVING WILL WE BE ABLE TO CHANGE OUR HISTORIC PRECEDENTS.

OALS/EROSION/NATURAL RESOURCES/ECOLOGY/DROUGHTS/HISTORY/CONSERVATION/ LAND RESOURCES/LAND USE/DUST STORMS/FLOODS/PERTURBATION/DEGENERATION/ ENVIRONMENTAL EFFECTS

65

SHAPLEY, H. ED.

1954

CLIMATIC CHANGE: EVIDENCE, CAUSES AND EFFECTS.

HARVARD UNIVERSITY PRESS, CAMBRIDGE. 318 P.

CLIMATIC CHANGE/ENVIRONMENTAL EFFECTS/CLIMATIC-VEGETAL RELATIONSHIPS/ HUMANS/CLIMATOLOGY/ENVIRONMENTAL IMPACT

66

SHERBROOKE, W.C./PAYLORE, P.

1973

WORLD DESERTIFICATION: CAUSE AND EFFECT. A LITERATURE REVIEW AND ANNOTATED BIBLIOGRAPHY.

UNIVERSITY OF ARIZONA, TUCSON, OFFICE OF ARID LANDS STUDIES, ARID LANDS RESOURCE INFORMATION PAPER 3. 168 P. AVAILABLE NTIS AS PB-228 100. SWRA W74-04461.

AN ANNOTATED BIBLIOGRAPHY OF 252 REFERENCES, COMPUTER-PRODUCED FROM THE UNIVERSITY OF ARIZONA'S ARID LANDS INFORMATION SYSTEM (ALIS), WITH ACCOMPANYING TEXT THAT REVIEWS BRIEFLY BOTH CAUSE AND EFFECT OF THIS WORLDWIDE PHENOMENON. CAUSES FALL INTO TWO CATEGORIES: LONG-TERM (IN THE GEOLOGIC SENSE) CLIMATIC CHANGE AS SUPPORTED BY METEOROLOGICAL, ARCHAEOLOGICAL, GEOMORPHOLOGICAL, VEGETATIONAL, PALYNOLOGICAL, AND DENDROCHRONOLOGICAL EVIDENCE IN THE LITERATURE; AND THOSE ACTIVITIES OF MAN'S HISTORIC OCCUPANCE OF ARID AND SEMIARID REGIONS THAT HAVE CONTRIBUTED TO DEGENERATION OF MARGINAL LANDS: AGRICULTURAL AND IRRIGATION PRACTICES, GRAZING, FIRE, NOMADISM, AND SAND STABILIZATION AND REFORESTATION. THE AUTHORS BELIEVE THAT BEYOND THESE TWO CATEGORIES, THERE IS A THIRD: CLIMATIC FLUCTUATION--SHORT-TERM WEATHER PATTERNS INDUCED BY UNCERTAIN RAINFALL AND FOLLOWED BY CYCLIC DROUGHTS FROM WHICH MARGINAL AREAS MAY NOT RECOVER IF SUBJECTED TO CONTINUED ATTEMPTS AT INTENSIVE USE THAT CANNOT BE SUSTAINED BY A DRY YEAR OR A SUCCESSION OF DRY YEARS. INSUFFICIENT WATER AND ATTEMPTS TO INCREASE WATER SUPPLIES TO AREAS ENDANGERED BY DESERTIFICATION ARE PROBLEMS WHICH MUST BE ADDRESSED PROMPTLY, BUT TRAINING, EDUCATION, FINANCING, AND CULTURAL ADAPTATIONS WILL ALSO BE REQUIRED, PROBABLY UNDER INTERNATIONAL SPONSORSHIP. (OALS)

OALS/DESERTS/DROUGHTS/BIBLIOGRAPHIES/SEMIARID CLIMATE/ARID CLIMATE/ ARID LANDS/WEATHER MODIFICATION/REFORESTATION/SOIL STABILIZATION/WATER SHORTAGE/GRAZING/BURNING/LAND USE/LAND MANAGEMENT/CONSERVATION/PLANT POPULATION

67

SIMONETT, D.S.

1975

EXAMPLES AND POTENTIALS FOR MONITORING DUNE SANDS AND DUNE MIGRATION.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. WS-F9454. 8 P.

FOCUSES ON THE APPLICATION OF REMOTE SENSING TO QUESTIONS OF DUNE FRAGILITY, DUNE TYPES AND ASSOCIATED MICRO-ENVIRONMENTS, PLANT COVER, WIND DAMAGE, AND SAND MOVEMENT. IT IS SUGGESTED THAT THE MAPPING OF UNVEGETATED, LIGHTLY VEGETATED, AND MODERATELY VEGETATED SAND DUNES AND CONTINUED MONITORING OF THEIR CONDITION AND MOTION ARE REASONABLE POSSIBILITIES WITH REMOTE SENSING (ERTS) IMAGES.

OALS/KWIC DE 24/DUNES/SAND DUNES/WIND EROSION/WIND ACTION/SAND CONTROL/REMOTE SENSING/PLANT COVER/EROSION CONTROL/VEGETATION/ VEGETATION MAPS/PLANT DISTRIBUTION/DESERTIFICATION

68

SIMONS, M.

1967

DESERTS, THE PROBLEM OF WATER IN ARID LANDS.

OXFORD UNIVERISTY PRESS, LONDON. 96 P. MGA 21.1-17. SWRA W70-02561.

AN EXTENSIVE AND WELL-ILLUSTRATED OVERVIEW OF DESERT CLIMATE, PLANTS, AND ANIMALS, WITH THE MAIN EMPHASIS ON SOURCES OF WATER: GROUNDWATER, WATER TRANSFER, DESALINATION, WEATHER MODIFICATION TO INCREASE RAINFALL. THE QUESTION IS RAISED CONCERNING THE ECONOMIC EFFICIENCY IN COMMITTING WATER DEVELOPMENTS IN ARID LANDS TO IRRIGATION RATHER THAN TO ALTERNATIVE USES. INCLUDED IS AN APPENDIX DESCRIBING THE KOEPPEN CLASSIFICATION OF DESERT CLIMATES, WITH EXAMPLES OF ITS APPLICATION. (OALS)

OALS/DESERTS/WEATHER MODIFICATION/DESALINATION/WATER TRANSFER/ GROUNDWATER/WATER SOURCES/KOEPPENS CLIMATIC CLASSIFICATION/CLIMATE/ DESERT PLANTS/DESERT ANIMALS/IRRIGATION WATER/WATER UTILIZATION/ ENVIRONMENTAL ENGINEERING/WATER RESOURCES DEVELOPMENT

69

STEBBING, E.P.

1954

FORESTS, ARIDITY AND DESERTS. IN J.L. CLOUDSLEY-THOMPSON, ED., BIOLOGY OF DESERTS, SYMPOSIUM ON THE BIOLOGY OF HOT AND COLD DESERTS, PROCEEDINGS, P. 123-128.

INSTITUTE OF BIOLOGY, LONDON.

THE AUTHOR IS CONCERNED WITH MAN'S INFLUENCE ON THE CREATION OF DESERTS. SHIFTING CULTIVATION, AN IMPORTANT CAUSE OF THE DESTRUCTION OF FORESTS, ALLOWS FOR CULTIVATION FOR A FEW YEARS, BUT EVENTUALLY A DENSE WEED GROWTH SUPERVENES AND/OR THE SOIL DECREASES IN FERTILITY MAKING THE LAND UNUSABLE. THE SHIFTING CULTIVATOR THEN MOVES ON AND REPEATS THE OPERATION IN ANOTHER PART OF THE FOREST. WITH THE WORLDWIDE INCREASE IN POPULATION AND IN THE INTENSITY OF THE MISUSE OF SOIL AND DECREASING WATER SUPPLIES, MIGRATION FROM AN EXHAUSTED AREA LEAVES THE SOIL EXPOSED TO THE NATURAL PROCESSES OF EROSION. MODERN DEVELOPMENTS WHICH AIDED IN THE CREATION OF THE DUST BOWLS IN THE UNITED STATES AND CANADA WITH LITTLE MORE THAN HALF A CENTURY HELP FROM MAN, MUST BE EVALUATED. OTHER CAUSES OF DESERTIFICATION INCLUDE FIRE, INCREASED POPULATIONS, CLIMATIC CHANGE, DESTRUCTION OF SOIL, DESICCATION, AND INTERMITTENT STAGES OF RAINFALL THAT COMBINED WITH MODERN TECHNOLOGY TO AID MAN IN HIS DESTRUCTION OF ARABLE LANDS. THE AUTHOR RECOMMENDS THAT STEPS BE TAKEN IMMEDIATELY TO STOP FURTHER DEGRADATION OF LAND TO HALT THE MARCH OF THE DESERTS. (OALS)

OALS/DESERTIFICATION/LAND USE/EROSION/DROUGHTS/MOISTURE DEFICIT/ SETTLEMENTS/ARIDITY /PERTURBATION/DEGENERATION/NOMADS/SOIL EROSION/ DESICCATION/CROP PRODUCTION/SOCIAL ASPECTS

70

TANNEHILL. I.R.

1947

DROUGHT, ITS CAUSES AND EFFECTS.

PRINCETON UNIVERSITY PRESS, PRINCETON.

SEMI-POPULAR TREATMENT OF DROUGHTS; RELATING HISTORY IN THE UNITED STATES AND WORLDWIDE. MUCH OF THE BOOK IS DEVOTED TO EXPLANATION OF GENERAL CLIMATOLOGICAL THEORY AND ITS RELATIONSHIP TO DROUGHTS.

OALS/DROUGHTS/PRECIPITATION(ATMOSPHERIC)/RAINFALL/METEOROLOGY/ CLIMATOLOGY

71

TRICART, J.

1969

TRAITE DE GEOMORPHOLOGIE. 4: LE MODELE DES REGIONS SECHES.

SOCIETE D'EDITION D'ENSEIGNEMENT SUPERIEUR (SEDES), PARIS. 472.

OUVRAGE DE REFERENCE, ABONDANTES BIBLIOGRAPHIES CLASSEES, PARTIELLEMENT ANALYTIQUES, VERITABLEMENT INTERNATIONALES. ETUDE DES PROCESSUS, DES DEPOTS, DES FORMES ACTUELS. INFLUENCE DES OSCILLATIONS CLIMATIQUES QUATERNAIRES. PHENOMENES DE DEGRADATION ANTHROPIQUE.

GEOMORPHOLOGY/LANDFORMS/CLIMATIC GEOMORPHOLOGY/QUATERNARY PERIOD/ BIBLIOGRAPHIES

72

UNESCO, PARIS

1973

MAN AND THE BIOSPHERE: FINAL REPORT OF THE EXPERT PANEL ON IMPACT OF HUMAN ACTIVITIES AND GRAZING PRACTICES ON GRAZING LANDS.

SAME AS AUTHOR. 90 P.

AN APPROACH TO ACHIEVING THE OBJECTIVE OF OPTIMIZING THE USE OF GRAZING LAND IS OUTLINED IN A MULTISTAGE FRAMEWORK, TAKING INTO ACCOUNT THE NEEDS FOR INVENTORY, ASSESSMENT AND FORMULATION OF MANAGEMENT PROGRAMS. SOME METHODOLOGICAL PRINCIPLES WARRANTING SPECIAL EMPHASIS IN THE PARTICULAR CIRCUMSTANCES OF M.A.B. PROJECT 3 ARE OUTLINED, INCLUDING THE NEED FOR STUDIES AT DIFFERENT LEVELS OF INTENSITY AND SOPHISTICATION, AND FOR FURTHER UNDERSTANDING OF THE PROCESS OF DIFFUSION OF KNOWLEDGE. FOUR THEMES ILLUSTRATE SOME OF THE MAJOR RESEARCH PROBLEMS: FORMULATION OF MANAGEMENT STRATEGIES FOR MAXIMUM SUSTAINED USE OF AREAS MARGINAL FOR CROP PRODUCTION; INTENSIFICATION OF USE OF GRAZING LANDS; MULTIPLE AND SPECIAL (NON-GRAZING) USES OF GRAZING LANDS; SPECIAL PROBLEMS OF MAN'S ATTITUDES AND RELATIONSHIPS TO PASTORAL LANDS AND GRAZING ANIMALS. FOUR CASE STUDIES ON GRAZING LANDS IN MEDITERRANEAN CLIMATE REGIONS, IN TROPICAL

REGIONS, IN TUNDRA REGIONS AND IN TEMPERATE REGIONS ARE GIVEN AS EXAMPLES OF THE TYPE OF RESEARCH ACTIVITY AND APPROACH TO PROBLEMS THAT MIGHT BE PROMOTED AT THE REGIONAL AND SUB-REGIONAL LEVELS.

HUMANS/ENVIRONMENTAL IMPACT/RANGES/RANGE MANAGEMENT/OVERGRAZING

73

UNESCO/WMO

1963

CHANGES OF CLIMATE, PROCEEDINGS OF THE ROME SYMPOSIUM ORGANIZED BY UNESCO AND THE WORLD METEOROLOGICAL ORGANIZATION.

UNESCO, PARIS. ARID ZONE RESEARCH 20. 488 P.

THE PROBLEM OF CLIMATIC FLUCTUATIONS IS ONE OF EXTREME COMPLEXITY RELATING TO MANY DISCIPLINES. AT THE SAME TIME IT IS OF PARTICULARLY GREAT IMPORTANCE IN THE ARID ZONE, WHERE MINOR VARIATIONS MAY HAVE CONSIDERABLE CONSEQUENCES. THIS SYMPOSIUM BROUGHT TOGETHER SCIENTISTS FROM SUCH FIELDS AS METEOROLOGY, OCEANOGRAPHY, GEOMORPHOLOGY, GEOGRAPHY, HYDROLOGY, BOTANY, GEOLOGY, AND ARCHAEOLOGY, TO OBTAIN A COHERENT AND COMPREHENSIVE PICTURE OF PRESENT KNOWLEDGE, THEORIES AND IMPLICATIONS OF CLIMATIC CHANGE. PAPERS ARE GROUPED INTO FOUR SECTIONS: 1) CHANGES DURING THE PERIOD OF METEOROLOGICAL RECORDS, 2) DURING LATE GEOLOGICAL AND EARLY HISTORICAL RECORDS, 3) THEORIES OF CHANGES OF CLIMATE, AND 4) SIGNIFICANCE OF CHANGES OF CLIMATE.

OALS/CLIMATIC CHANGE/METEOROLOGICAL DATA/CLIMATIC DATA/ PALEOCLIMATOLOGY/ATMOSPHERIC CIRCULATION/QUATERNARY PERIOD/CLIMATIC GEOMORPHOLOGY/EVOLUTION/GEOLOGIC TIME

74

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT, WASHINGTON, D.C., OFFICE OF SCIENCE AND TECHNOLOGY

1972

DESERT ENCROACHMENT ON ARABLE LANDS: SIGNIFICANCE, CAUSES, AND CONTROL.

SAME AS AUTHOR. 55 P. TA/OST/72/10.

MAN'S ATTEMPT TO SETTLE IN SEMI-ARID REGIONS OF THE WORLD HAS OFTEN BEEN HINDERED OR THWARTED BY THE SEEMINGLY RELENTLESS PROGRESSION OF ADJACENT DESERTS. EITHER BECAUSE OF CLIMATIC FLUCTUATIONS OR MAN'S INTERVENTION IN THE FRAGILE, DELICATELY-BALANCED ECOLOGICAL ZONES BORDERING DESERT AREAS, OR DUE TO A COMPLEX INTERACTION OF THESE TWO FACTORS, MARGINAL BUT POTENTIALLY PRODUCTIVE LAND HAS BEEN ABSORBED INTO THE ENCROACHING DESERT WITH ATTENDANT ECONOMIC AND SOCIAL LOSSES. WHILE THIS SITUATION HAS BEEN EXPERIENCED AS LONG AS MAN HAS INHABITATED THESE REGIONS, THE MAGNITUDE OF THE PROBLEM IS RAPIDLY INTENSIFYING AND ITS IMPACT BECOMING MORE ACUTE AS POPULATION GROWTH, AND A SHIFT FROM NOMADISM TO A MORE SEDENTARY EXISTENCE, CREATE PRESSURE FOR THE DEVELOPMENT OF SEMI-ARID BORDER LANDS.

KWIC DE 17/OALS/DESERTIFICATION/SETTLEMENTS/GRAZING/DESICCATION/ CLIMATIC CHANGE/ECOSYSTEMS/TANGIBLE BENEFITS/INTANGIBLE BENEFITS/LAND USE/ARID CLIMATE /SEMIARID CLIMATE/ECONOMICS/CROP PRODUCTION/ AFFORESTATION/ARID LANDS/NOMADS/WATER MANAGEMENT/SHELTERBELTS/ WINDBREAKS

75

U.S. OFFICE OF WATER RESOURCES RESEARCH, WASHINGTON, D.C., WATER RESOURCES SCIENTIFIC INFORMATION CENTER

1973

WEATHER MODIFICATION: PRECIPITATION INDUCEMENT. A BIBLIOGRAPHY.

SAME AS AUTHOR. 246 P.

A COMPILATION OF ABSTRACTS PRODUCED FROM THE COMPUTERIZED INFORMATION BASE COMPRISING SELECTED WATER RESOURCES ABSTRACTS (SWRA). ACCESS IS BY WAY OF A KWIC-TYPE WRAP-AROUND INDEX, WITH SIGNIFICANT KEYWORDS IN ALPHABETICAL ORDER. REFERENCE IS TO THE COMPLETE ABSTRACT BY DOCUMENT NUMBER. THERE IS AN AUTHOR INDEX ALSO. COVERAGE INCLUDES ARTIFICIAL PRECIPITATION, CLOUD SEEDING, RAINFALL, WATER YIELD IMPROVEMENT, AND LEGAL ASPECTS, AS WELL AS SPECIFIC GEOGRAPHIC AREAS. (OALS)

KWIC W 26/OALS/WEATHER MODIFICATION/BIBLIOGRAPHIES/ARTIFICIAL PRECIPITATION/ENVIRONMENTAL ENGINEERING/CLOUD SEEDING/WATER YIELD IMPROVEMENT/LEGAL ASPECTS

76

UVAROV, B.P.

1962

DEVELOPMENT OF ARID LANDS AND ITS ECOLOGICAL EFFECTS ON THEIR INSECT FAUNA. IN THE PROBLEMS OF THE ARID ZONE, PROCEEDINGS OF THE PARIS SYMPOSIUM.

UNESCO, PARIS. ARID ZONE RESEARCH 18:235-248.

REVIEW OF PROBLEMS IN THE AGRICULTURAL IMPACT OF WORLDWIDE ARID LANDS DEVELOPMENT AND THE RECIPROCAL INTERACTIONS WITH THE NATIVE INSECT FAUNA. SPECIFIC RECOMMENDATIONS ARE MADE FOR THE CIRCUMVENTION OF FUTURE DISASTERS.

OALS/ARID LANDS/ECOLOGY/COMPETITION/ENVIRONMENTAL EFFECTS/PLANNING/LAND USE/ECONOMIC DEVELOPMENT/INSECT BEHAVIOR/INSECTS/ENTOMOLOGY/LAND MANAGEMENT/BIBLIOGRAPHIES/ARABLE LAND

77

VAN EIMERN, J. ET AL

1964

WINDBREAKS AND SHELTERBELTS.

WORLD METEOROLOGICAL ORGANIZATION, TECHNICAL NOTE 59. 188 P.

WINDBREAKS/SHELTERBELTS/ENVIRONMENTAL ENGINEERING

78

VON WISSMANN, H. ET AL

1956

ON THE ROLE OF NATURE AND MAN IN CHANGING THE FACE OF THE DRY BELT OF ASIA. IN W.L. THOMAS, JR., ED., MAN'S ROLE IN CHANGING THE FACE OF THE EARTH, P. 278-303.

UNIVERSITY OF CHICAGO PRESS, CHICAGO.

SUMMARIZES THE GEOGRAPHICAL AND ANTHROPOLOGICAL HISTORY OF THE RISE, SPREAD AND DEVELOPMENT OF CULTURES, WITH EMPHASIS ON THE EFFECT OF CLIMATE AND ON THE DEVELOPMENT OF HERDING, AGRICULTURE AND NOMADISM. EARLY MIGRATION WAS FACILITATED BY THE STEPPE VEGETATION THAT COVERED MOST OF THE DRY BELT(DURING THE LAST ICE AGE) ALLOWING MORE MIGRATION THAN PRESENT-DAY VEGETATION. VEGETATION STUDIES OF THE DRY BELT (EXTENDING TO INNER ASIA, CENTRAL EUROPE AND CHINA) INDICATE THAT BECAUSE OF LOWER TEMPERATURES, THE BOUNDARIES OF THE THERMAL ZONES WERE EXTENDED OVER MUCH GREATER DISTANCES THAN BOUNDARIES OF HUMID ZONES-INCLUDING ARABLE STEPPE AND DESERT STEPPE. CIVILIZATION SPREAD THROUGHOUT ASIA WITH SETTLEMENTS DEVELOPING CEREAL FARMING, HERDING OF SHEEP AND GOATS, AS WELL AS ELEMENTARY TYPES OF IRRIGATION AND OASIS ECONOMY. FARMING AND HERDING SPREAD INTO 3 DISTINCT REGIONS: 1) THE MIDDLE BELT OF MOROCCO AND SPAIN TO NORTHERN CHINA, WHERE NATURAL OASES AND IRRIGATION ARE STILL OF GREATEST IMPORTANCE; 2) THE SOUTHERN BELT OF THE TROPICAL STEPPE OF THE SUDAN; 3) THE NORTHERN BELT FROM MANCHURIA AND NORTHERN MONGOLIA TO KAZAKHSTAN, SOUTHERN RUSSIA, AND RUMANIA.

KWIC DE 19/OALS/ARID LANDS/ARID CLIMATE/SEMIARID CLIMATE/SOCIAL ASPECTS/HISTORY/GRAZING/CLIMATOLOGY/AGRICULTURE/CLIMATIC-VEGETAL RELATIONSHIPS/VEGETATION CHANGE/MIGRATION/NOMADS/CENTRAL ASIA/MIDDLE ASIA/ARABIAN PENINSULA/AFRICA/CHINA/USSR

79

WALLEN, C.C.

1967

ARIDITY DEFINITIONS AND THEIR APPLICABILITY.

GEOGRAFISCKA ANNALER 49(2-4):367-384. GA 68B-512. SWRA W69-02384.

REVIEWS VARIOUS APPROACHES TO THE PROBLEM OF DEFINING ARIDITY, WITH PARTICULAR EMPHASIS ON SUCH INDICES AS DEVELOPED BY KOEPPEN, DE MARTONNE, EMBERGER, ETC., AND COMPARES THE MODERN WATER BALANCE CONCEPT OF THORNTHWAITE, PENMAN, AND BUDYKO. EXAMPLES ARE GIVEN USING THE AGROCLIMATOLOGY OF THE NEAR EAST (LEBANON, SYRIA, JORDAN, IRAQ, AND IRAN).

OALS/ARIDITY/ARIDITY INDEX/EMBERGER, L./THORNTHWAITE, C.W./PENMAN, H.L./MARTONNE, E. DE/WATER BALANCE/MIDDLE EAST/BUDYKO, M.I./ AGRICULTURAL CLIMATOLOGY

80

WARREF, A.

1969

A BIBLIOGRAPHY OF DESERT DUNES AND ASSOCIATED PHENOMENA. IN W.G. MCGINNIES AND B.J. GOLDMAN, EDS., ARID LANDS IN PERSPECTIVE, P. 77-99.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C./ UNIVERSITY OF ARIZONA PRESS, TUCSON. 421 P.

APPROXIMATELY 800 ITEMS ARE LISTED COVERING WORLD-WIDE LITERATURE ON SAND DUNES FOR OVER 90 YEARS, WITH EMPHASIS ON REFERENCES TO THE SAHARA, THE U.S., AND POLAND. THE MATERIAL IS ARRANGED ALPHABETICALLY WITHIN 20 YEAR CHRONOLOGICAL DIVISIONS, UNDER THE FOLLOWING CATEGORIES: SAND DUNES EXCLUSIVE OF COASTAL DUNES, SAND MOVEMENT BY WIND, AND AEOLIAN SAND. (AUTHOR)

SANDS/OALS/BIBLIOGRAPHIES/SAHARA/DUNES/WIND ACTION/EOLIAN SOILS

81

WHITE, G.F.

1960

SCIENCE AND THE FUTURE OF ARID LANDS.

UNESCO, PARIS. 96 P.

AN EXCELLENT REVIEW OF THE PROBLEMS OF DEVELOPMENT IN ARID LANDS AND UNESCO'S ROLE. IN REGARD TO DESERTIFICATION, SINCE ABOUT 2000 B.C. THE FLUCTUATIONS OF TEMPERATURE AND PRECIPITATION HAVE BEEN SUBSTANTIAL, BUT SHOW NO MARKED TRENDS. DURING THE LAST 50 YEARS THERE HAS BEEN A SLIGHT TENDENCY TOWARD HIGHER TEMPERATURES AND LOWER PRECIPITATION. THE MORE DRAMATIC EXAMPLES OF RESOURCE DESTRUCTION DURING THE PAST 3000 YEARS MUST BE TRACED TO MAN RATHER THAN CLIMATE. CHAPTERS PRESENT MATERIAL ON INSTABILITY AND PROMISE, WATER VEGETATION AND SOIL, ANIMAL LIFE, SUN, MINERALS AS ECONOMIC STIMULANTS. THE STRATEGY FOR INTERNATIONAL COLLABORATION, EXCHANGE OF IDEAS, EDUCATION AND FUTURE RESEARCH IS DISCUSSED. THE AUTHOR SEES MINERAL RESOURCE EXPLOITATION AS A TIME-LIMITED SOURCE OF NEEDED CAPITAL TO IMPROVE THE RENEWABLE RESOURCE POTENTIAL OF ARID LANDS. GRAZING MANAGEMENT IS AN URGENT NEED, REQUIRING NOT ONLY KNOWLEDGE OF TECHNIQUES, BUT OF THE SOCIOLOGICAL PROBLEMS INVOLVED IN INTEGRATING WISE LAND USE PRACTICES INTO THE FABRIC OF PASTORAL CULTURES.

LAND TENURE/OALS/ARID LANDS/VEGETATION/CLIMATOLOGY/SOCIAL ASPECTS/ IRRIGATION/LAND MANAGEMENT/EROSION/LAND USE/RANGE MANAGEMENT/NATURAL RESOURCES/DESERTIFICATION/DESICCATION/NOMADS/CLIMATIC CHANGE/GRAZING/ LAND RESOURCES/ECONOMIC IMPACT

82

WHITE, G.F.

1966

DESERTS AS PRODUCING REGIONS TODAY. IN E.S. HILLS, ED., ARID LANDS: A GEOGRAPHICAL APPRAISAL, P. 421-437.

METHUEN, LONDON/UNESCO, PARIS. 479 P.

THE PRESENT NEED OF RESOURCE MANAGEMENT IN THE WORLD'S ARID LANDS IS DISCUSSED. FACTORS AND PROBLEMS INVOLVED IN DECISION MAKING AT GOVERNMENTAL LEVEL ARE RELATED TO ESTIMATING THEIR RESOURCES, TECHNOLOGY AND ECONOMIC EFFICIENCY. FREQUENTLY IN THE PAST THERE HAS BEEN A TENDENCY FOR PUBLIC BODIES TO UNDERESTIMATE THE COSTS OF NEW IRRIGATION AND TO OVERESTIMATE THE BENEFITS. WITH INCREASING COMPLEXITY OF MANAGEMENT SCHEMES IT BECOMES MORE IMPORTANT TO LINK PROJECTS OF GEOGRAPHICALLY ADJACENT AREAS, OFTEN CROSSING POLITICAL BOUNDARIES. VARIOUS DIFFERENT SOCIOLOGICAL BENEFITS CAN RESULT, DEPENDING ON GOAL ORIENTATION. EXAMPLES ILLUSTRATE THE CONCEPTS DISCUSSED.

OALS/ARID LANDS/NATURAL RESOURCES/REGIONAL ANALYSIS/LAND RESOURCES/ WATER RESOURCES DEVELOPMENT/DESERTS/LAND MANAGEMENT/ECONOMIC DEVELOPMENT

83

WHITE, G.F.

1970

UNRESOLVED ISSUES. IN H.E. DREGNE, ED., ARID LANDS IN TRANSITION, P. 481-491.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C., PUBLICATION 90. SWRA W71-C8450.

THIS FINAL PAPER GIVEN AT AN INTERNATIONAL SYMPOSIUM ON ARID LANDS IN A CHANGING WORLD SUMMARIZES THE MAJOR SOCIAL ISSUES CRITICAL IN RESOURCE DEVELOPMENT. HE CITES OVERPOPULATION, MASSIVE MIGRATION FROM RURAL TO URBAN AREAS, AND LACK OF LOCAL EDUCATION, TECHNOLOGY, AND FUNDING. QUESTIONS RAISED RELATE TO THE ROLE OF IRRIGATION, WHETHER NEW DEVELOPMENT SHOULD EXPAND OR INTENSIFY, WHETHER THE SINGLE BIG PROJECT SHOULD TAKE PRECEDENCE OVER DIVERSE SMALLER MEASURES, WHAT THE ROLE OF AMENITIES SHOULD BE, WHETHER BASIC RELATIONSHIPS OR PROBLEM-SOLVING SHOULD BE STRESSED, HOW WORLD LINKAGES CAN BE ACHIEVED, AND IF INTEGRATED STUDY AND ACTION CAN BE ACCOMPLISHED. (OALS)

OALS/ARID LANDS/SOCIAL ASPECTS/LEGAL ASPECTS/POLITICAL ASPECTS/ NATURAL RESOURCES/ENVIRONMENTAL ENGINEERING/IRRIGATION PRACTICES

84

WHYTE, R.O.

1966

THE USE OF ARID AND SEMI-ARID LAND. IN E.S. HILLS, ED., ARID LANDS: A GEOGRAPHICAL APPRAISAL, P. 301-361.

METHUEN, LONDON/UNESCO, PARIS. 479 P.

THIS REVIEW OF THE PAST AND PRESENT USE AND MISUSE OF ARID AND SEMI-ARID LANDS AND THEIR POTENTIALITIES FOR FUTURE DEVELOPMENT IS BASED PRIMARILY ON THOSE LANDS THAT LIE BETWEEN THE ATLANTIC OCEAN IN THE WEST AND THE GANGETIC PLAIN IN INDIA IN THE EAST. LAND DETERIORATION HAS RESULTED FROM IGNORANCE, STEADILY INCREASING HUMAN AND LIVESTOCK POPULATIONS, AND A LONG SEQUENCE OF WARS AND INVASIONS. TOPICS TREATED ARE ECONOMIC AND SOCIAL ASPECTS, CLIMATE AS A CONTROLLING AND LIMITING FACTOR, LAND USE ALONG HUMIDITY GRADIENTS, CONSERVATION AND MANAGEMENT OF VEGETATION, ANIMAL HUSBANDRY, CROP HUSBANDRY, CULTIVARS OF THE SEMI-ARID ZONES, TREES IN THE DESERT, CLASSIFICATION OF LAND, AND INTEGRATED LAND-USE. IN NEW LANDS (NORTHERN AUSTRALIA, ICARAGUA, AND PARTS OF BRAZIL) IT IS NECESSARY TO FIND AN ECOLOGICAL EQUILIBRIUM WHICH WILL PERMIT MAN AND HIS ANIMALS TO USE THE LAND AND ITS PARTIALLY UNUSED RESOURCES WITHOUT REDUCING TOO FAR ITS CAPACITY FOR CONSERVATION. IN OTHER AREAS IT IS NECESSARY TO RECOVER SOME NEW EQUILIBRIUM TO REPLACE THE ONE THAT WAS PASSED CENTURIES AGO DURING THE EVOLUTION OF ECOLOGICALLY IGNORANT CIVILIZATIONS. THE BASIC PROBLEM OF THE ARID AND SEMI-ARID ZONES OF THE OLD WORLD IS THE RECOGNITION OF ECOLOGICAL OVER-DEVELOPMENT AND THE INITIATION OF ACTIONS TO BRING MAN AND HIS ANIMALS AGAIN INTO HARMONY WITH THEIR ENVIRONMENT.

OALS/AFRICA/ARID LANDS/ARID CLIMATE/SEMIARID CLIMATE/LAND USE/LAND MANAGEMENT/HISTORY/CONSERVATION/VEGETATION/GRAZING/SOCIAL ASPECTS/ECOLOGY/PASTURES/RANGE MANAGEMENT/LIMITING FACTORS/ECONOMICS/NOMADS/ENVIRONMENTAL EFFECTS/CROP PRODUCTION/EVOLUTION/ECONOMIC DEVELOPMENT/DESERTIFICATION

85

WOODBURY, R.B. ED.

1962

CIVILIZATIONS IN DESERT LANDS.

UNIVERSITY OF UTAH, ANTHROPOLOGICAL PAPERS 62. 88 P.

DESERTS/HUMANS/SOCIAL ASPECTS/IRAQ/EGYPT/SOUTHWEST U.S./MESOPOTAMIAN PLAIN/TURKEY/SYRIA/ISRAEL/AGRICULTURE/IRRIGATION PRACTICES/PAKISTAN/INDIA/MEXICO/ARABIAN DESERT/SETTLEMENTS

86

WORLD METEOROLOGICAL ORGANIZATION

1954

ARTIFICIAL INDUCEMENT OF PRECIPITATION WITH SPECIAL REFERENCE TO THE ARID AND SEMI-ARID REGIONS OF THE WORLD.

SAME AS AUTHOR. TECHNICAL NOTE 1. 24 P. WGA 11M-573.

THIS REVIEW OF WORLDWIDE WEATHER MODIFICATION EFFORTS IS BASED ON REPLIES RECEIVED TO AN INQUIRY BY THE WMO SECRETARIAT. INCLUDED ARE A BRIEF CRITICAL STUDY OF RESULTS ACHIEVED BY VARIOUS PROJECTS, A GENERAL ANALYSIS OF ATMOSPHERIC CONDITIONS FAVORING RAINMAKING EXPERIMENTS IN VARIOUS COUNTRIES, AND SURVEY AND TENTATIVE EVALUATION OF CURRENT TECHNIQUES, AND A LIST OF REFERENCES (87) ARRANGED BY CONTINENTS. IT FOUND THAT OPERATIONS HITHERTO CARRIED OUT PROVED INCONCLUSIVE, REGIONS AND SEASONS FAVORING NATURAL PRECIPITATION ARE ALSO MOST FAVORABLE FOR ARTIFICIAL INDUCEMENT OF PRECIPITATION, AND PRESENT-DAY TECHNIQUES HAVE VERY LITTLE VALUE, IF ANY, IN AUGMENTING PRECIPITATION IN AREAS OF EVERY LOW RAINFALL OR DURING DRY PERIODS IN REGIONS OF NORMALLY MEDIUM RAINFALL. SCIENTIFICALLY RIGOROUS EXPERIMENTATION, DEVELOPMENT OF PRECISE METHODS OF EVALUATION, COLLABORATION WITH METEOROLOGICAL AUTHORITIES AND EXCHANGE OF INFORMATION ARE RECOMMENDED.

OALS/WEATHER MODIFICATION/ARTIFICIAL PRECIPITATION/WEATHER DATA/ METEOROLOGICAL DATA/BIBLIOGRAPHIES/DRY SEASONS /PRECIPITATION DEFICIT/ ARID LANDS/SEMIARID CLIMATE/ARID CLIMATE

87

WORLD METEOROLOGICAL ORGANIZATION, GENEVA, COMMISSION FOR AGRICULTURAL METEOROLOGY

1975

DROUGHT AND AGRICULTURE.

SAME AS AUTHOR. TECHNICAL NOTE 138. 127 P.

A SYSTEMATIC ANALYSIS OF DROUGHT FROM THE AGRICULTURAL POINT OF VIEW, COVERING DEFINITIONS, METEOROLOGICAL INDICES OF AGRICULTURAL DROUGHT, DROUGHT AND WATER REQUIREMENTS, DISEASES AND PESTS IN DROUGHT, LOCAL ENVIRONMENTAL CONTROL AND DROUGHT, AND THE NEED FOR A WORLD CLIMATIC WATCH. SPECIAL ATTENTION IS GIVEN TO VARIOUS INTERPRETATIONS OF THE WATER-BALANCE EQUATION, AGRICULTURAL PRACTICES UNDER DROUGHT CONDITIONS COVERING THE DROUGHT RESISTANCE OF PLANTS AND SEEDS, THE USE OF FALLOW AS A MANAGEMENT TECHNIQUE UNDER DRY CONDITIONS, AND THE DANGER OF EROSION OF DROUGHT-AFFECTED SOILS. EFFECTS OF DROUGHT ON PASTURES AND LIVESTOCK ARE ALSO CONSIDERED. APPLICATION OF STANDARD STATISTICAL TECHNIQUES ALREADY USED WITH SOME SUCCESS IN DROUGHT STUDIES IS DISCUSSED, WITH EXAMPLES. (OALS)

DROUGHTS/DROUGHT TOLERANCE/SOIL EROSION/WATER BALANCE/ARIDITY INDEX/ AGRICULTURAL METEOROLOGY/PASTURES/PLANTING MANAGEMENT/MOISTURE DEFICIT/ LIVESTOCK/ANALYTICAL TECHNIQUES/WATER REQUIREMENTS/METEOROLOGICAL DATA

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