

## **IUCN/WWF adopt 5-year plan for project operations**

The World Wildlife Fund has adopted continuous programming for projects included in IUCN/WWF Joint Project Operations.

This will permit more effective planning of project operations and will ensure that priority is given to projects that accord with the most important conservation requirements.

The arrangements adopted cover a plan involving projects programmed to implement in a broad way priorities emerging from IUCN/WWF's continuing survey of world conservation needs.

This plan involves four separate programmes:

- 1) a *basic programme* established each year in accordance with priorities as indicated by the survey that can be funded from foreseeable income;
- 2) an *emergency programme* to deal with unforeseen emergencies of highest world priorities;
- 3) a *biotope acquisition programme* which has already been established on a revolving fund basis;
- 4) an *optional or reserve programme* to be implemented if additional funds become available after completing the other programmes.

The priority subject areas established by the continuing survey of world conservation needs will be used as the basis of these programmes. These subject areas will provide continuity in programme structure and will be revised periodically in the light of IUCN/WWF's findings.

The subject areas will be used as a framework of a five-year plan. Within each subject area a series of projects will be progressively elaborated. Projects chosen from them each year will make up the basic programme and the optional programme.

The major thrust will be in the area of conservation of wild species and biotic communities, and this will account for at least 60–70 % of the programme. However, more attention will be given to projects concerned with (a) man and environment interactions, and (b) conservation education and information.

The following outline indicates the main topics that will be covered in WWF/IUCN programming, with specific projects evolved within 13 subject areas.

Priorities will be accorded to specific projects in relation to a combination of factors including:

- a) biogeographical and ecological criteria;
- b) degree of danger to the biotic community;
- c) availability of local support and its likely effectiveness;
- d) the conservation action content;

- e) extent to which the country concerned can itself finance projects, or obtain assistance from inter-governmental organizations;
- f) capability of proposed project personnel.

### **Subject Areas**

#### *Conservation of Wild Species and Biotic Communities*

1. Action directed toward the planning and establishment of national parks and reserves.

This area is of continuing importance and has as an aim the establishment of an adequate network of parks and reserves including representative areas of all biotic regions and communities and the widest range of wild species.

There are numerous biotic provinces in which no effective system of parks or reserves exists and here there is the risk of losing not a few species or communities but a total unique and distinctive biota.

2. Action directed toward improved management and protection of national parks and reserves.

Because the resources of developing countries rarely can provide the full range of trained manpower, equipment or other infrastructure required to protect national parks or reserves or manage them in accordance with international standards, a high percentage of WWF/IUCN spending has gone and will continue to go to this area.

3. Action directed toward more effective protection and management of wild species and their habitats other than through the establishment of parks and reserves.

Even with the most effective network of parks and reserves many wild species, particularly wide ranging or migratory forms, will lack adequate protection. WWF/IUCN will continue to emphasize projects which attempt to provide more adequate protection or management for wild species outside of the network of specially protected areas. It is recognized that large numbers of species and groups of species are now in a highly endangered or vulnerable status.

4. Surveys and inventories of species and biotic communities and identification of factors influencing their survival.

This area of activity has necessarily involved WWF/IUCN in the past and must be strengthened in the future if an effective job of conservation is to be done.

5. Research directed toward identifying and controlling factors endangering species and biotic communities or finding means for improving the conservation status of species or areas.

Although biological research, in general, is beyond the scope of WWF/IUCN funding, a certain amount of target-oriented research is needed if conservation objectives are to be achieved.

6. Investigations of effects of pollutants on wild species and biotic communities and means for controlling their dissemination.

One of the greatest overall threats to wildlife is in the dissemination of toxic chemicals throughout the environment. Although some attention has been given to this area by WWF/IUCN in the past, a considerable expansion of effort is intended.

#### *Man and Environment Interactions*

7. Action directed toward integrated planning and control over land and water use to ensure more effective conservation.

This area is closely related to area 3. above as well as area 1. It forms a basis for conservation action both through identifying areas suitable for reserves and providing more adequate protection for species outside reserves. Less effort has been directed toward this area in the past, but greater effort will be given to it in the future.

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8. Investigations related to optimum levels of human populations, technological development and resource use in relation to the need to maintain natural communities and wild species as part of a high quality environment.

This is not an area of much activity by WWF/IUCN in the past but is one that will be given attention during the five-year period. Appropriate projects could include investigations of recreational carrying capacity of national parks; investigations of appropriate levels of touristic development in relation to protection of environments; means for controlling human impact on fragile environments; overall investigations of environmental quality in relation to human needs and aspirations in developing countries.

9. Action to influence economic development practices to protect conservation values.

Although a major activity of IUCN, this area has not received much attention in the joint action programme of WWF/IUCN. Projects are being developed in a wide range of areas including particularly those related to the development of sub-polar, arid and semi-arid lands and tropical forest ecosystems.

10. Action to develop more effective environmental policies, laws, regulations, and administrative procedures.

Projects in this area range from the drafting of international conventions through to the development of local policy toward pollution, wildlife or other conservation areas. Although usually not an area requiring major funding, it will remain a focus for WWF/IUCN attention during the five-year programme.

Assistance will be given to governments in introducing effective overall environmental policies that will include action to establish a network of national parks and to organize wildlife management.

#### *Conservation Education and Information*

This sector has received continuing attention from WWF/IUCN in the past and will be given further emphasis in the future.

Projects may be considered under three categories:

11. Programmes to awaken public awareness and improve public understanding of conservation values.
12. Provision of more effective training for conservation specialists.
13. Improvement of conservation education in schools.

### **US Conference to conclude Convention on trade in endangered species**

A comprehensive intergovernmental Conference on the conservation of endangered wildlife will convene in Washington in February 1973. Over 100 nations are expected to participate.

The Conference, which will be hosted by the United States Government, will seek to conclude a Convention barring most trade across international boundaries in animals and plants now threatened by extinction. A stringent system of controls is to be set up to regulate the limited exceptions.

The meeting represents the culmination of years of preparatory work by both governments and private organizations. IUCN has prepared successive model conventions starting in 1963. The latest, incorporating suggestions by the Government of Kenya and other Governments and by private conservation groups, will be proposed by the United States as the basic working paper of the Conference.

The Conference will take place from 12 February to 3 March 1973, in the Department of State's Conference Suite. The final document emerging from the meeting will require ratification by the states seeking accession to the Convention.

### **Revision of Red Data Book on mammals now in press**

Volume I, *Mammalia*, of the Red Data Book has been extensively revised and is now in press. Copies will be available early in 1973, and may be ordered now.

The major revision and reorganization was made during the past year by the IUCN Secretariat, principally Harry A. Goodwin and Colin W. Holloway, with the advice and guidance of the Survival Service Commission. In the process, data on each listing was carefully reviewed. New information was added. New sheets for vulnerable species believed likely to move into the endangered category in the near future were added.

Information is assembled in the form of short reports under a series of uniform headings. The object of the data sheets is to draw attention to the dangers facing these species, and to provide fundamental background data, as a basis on which to develop conservation or rehabilitation programmes. In addition, by showing at a glance what is known and what gaps need to be filled, it is hoped that the publication of these sheets will stimulate interest in filling the gaps. Price for the new Volume I is US\$16 including the standard loose-leaf binder. For those who already own the Red Data Book, the price for the new sheets alone is US\$12.

The preparation of new sheets and the revision of index sheets, where necessary, will be undertaken periodically and will be available for purchase from IUCN.

#### **Red Data Book categories**

As a guide to the status of the taxa included, the data sheets are printed on coloured sheets in accordance with the following categories:

##### *1. Red Sheets – Endangered*

Taxa in danger of extinction, the survival of which is unlikely if the causal factors continue operating.

These taxa are those where numbers have been reduced to a critically low level or the extent of their habitat has been so drastically reduced that they are deemed to be in immediate danger of extinction.

##### *2. Amber Sheets – Vulnerable*

Taxa believed likely to move into the endangered category in the near future if the causal factors now at work continue operating.

Included are taxa in which most or all populations are *decreasing* because of over-exploitation, massive depletion of habitat or other environmental disturbance; taxa with populations which have been heavily *depleted* by adverse factors, and the ultimate security of which is not yet assured; and taxa with populations which are still abundant but which are *under threat* from serious adverse factors throughout their range.

##### *3. White Sheets – Rare*

Taxa with small world populations which are not at present endangered or vulnerable, but which are at risk.

These taxa are localized within a restricted geographical area or habitat or are thinly scattered over a more extensive range. They may be island forms or those otherwise reproductively isolated, or they may be relict forms with wide distribution. They may also be forms seldom recorded but which may be commoner than supposed although there is reasonably good evidence that their numbers are low.

##### *4. Green Sheets – Out of danger*

Taxa formerly included in one of the above categories but which are now considered relatively secure because effective conservation measures have been taken or the previous threat to their survival has been removed.

##### *5. Grey Sheets – Inadequately known*

Taxa which are suspected of belonging to one of the first three categories but for which insufficient information is available on which to base a decision.

## **"Operation Tiger"**

Efforts to save India's hard-pressed tiger from fast-approaching extinction are not new, despite the current surge of interest. IUCN and WWF have continually urged that increasing efforts be made toward a solution, backing these urgings with projects, money-raising and action campaigns such as "Operation Tiger", launched early in 1972.

The problem has been very clear: a fast downward slide in numbers that could have only one conclusion unless arrested promptly – extinction. Within the lifetimes of most readers of this article, tigers in India were numbered in tens of thousands. In 1969, during the IUCN 10th General Assembly in New Delhi, the number was estimated at 4000. Now, not even 4 years later, the estimated total has dropped to roughly half the 1969 figure.

This is confirmed by a nation-wide survey, undertaken in April/May 1972 by the Indian Forest Service, which revealed approximately 1870 tigers of all ages in all of India! Even though the total is thought to be conservative, the downward trend is ominously unmistakable.

Operation Tiger involves WWF raising a million dollars, but this must be regarded as "seed money". The Government of India intends to raise some counterpart funds. Establishment of eight selected reserves for the tiger – which is among the recommendations made to the Prime Minister – will be costly indeed since some of them will be larger than 250,000 ha.

Other recommendations call for reducing opportunities for clashes between tigers and villagers and for reinforcing legislation banning traffic in tiger skins and other tiger "products".

The enormous difficulties in carrying out these measures must not be underestimated, but unless this plan – or something similar – is put into force very soon Indian's magnificent tiger will be largely a memory. For all its riches, the world cannot afford a loss of that magnitude.

## **IUCN International Workshop on Environmental Studies in Higher Education and Teacher Training**

Since the IUCN seminar on Environmental Conservation Education at the University Level, held in Lucerne in 1966, there have been rich developments in terms of new environmental education programmes launched at universities, colleges and other institutions of higher education all over the world.

As a result of this burgeoning interest, the need for review and assessment of the whole field had been felt for some time. The 1972 pre-IUCN General Assembly working meeting on education was devoted to the review and discussion of problems of environmental teacher training. This topic has also been dealt with at two special IUCN-sponsored international courses during the summer of 1972.

The International Workshop on Environmental Studies in Higher Education and Teacher Training assembled about 70 representatives of educational programmes, mostly university and college teachers, from 25 countries. It was hosted by the Althouse College of Education, University of Western Ontario, London, Ontario, Canada, from 5 to 7 September 1972. Professor Paul B. Park, Director of the Early School Environment Study project of the host institution, chaired the Workshop and the Organizing Committee.

The Workshop split into seven working groups to discuss three main themes: A – Training of teachers in pre-service and in-service education; B – Environmental programmes for under-graduate students; C – Environmental education in professional fields.

One particularly important issue identified at the Workshop was the urgent priority in reaching decision makers by appropriate environmental education. This was also

reflected in Resolution No. 23 (Environmental Education for Professionals) of the IUCN 11th General Assembly.

Dr. Gerardo Budowski, IUCN Director General, presented the keynote address, "Environmental Conservation for Development and the Relevant Role of Education".

The Workshop conclusions will be published soon.

## **Working meeting on threatened and depleted seals of the world**

The SSC/IUCN Seal Group met at the University of Guelph, Ontario, 18–19 August 1972, to review the current status of threatened and depleted seals and to recommend measures to improve their conservation.

Priority in projected threatened species programmes was accorded, first, to the monk seals (Caribbean, Hawaiian and Mediterranean) and, secondly, to the fur seals (Galapagos, Guadalupe and Juan Fernandez). In relation to the conservation of the world seal resources as a whole, the meeting recommended: study of the possible effects of commercial fishing on certain seal populations, monitoring of seal populations subjected to control measures, curbs on pollution or development that might impair coastal environments, restriction of human activity in seal whelping grounds, and initiation of research programmes in all countries that have seals on their coasts.

The proceedings of the meeting will be published in IUCN Supplementary Paper No 39.

## **Herbert H. Mills**

Herbert H. Mills, former Executive Vice President of World Wildlife Fund-US and a member of the Executive Board of WWF-International, died suddenly on 21 October. He was 62.

Mr. Mills had long been prominent in conservation matters, particularly in the United States. He served WWF four years, and contributed much to the growth and strength of the organization. Prior to joining WWF, Mr. Mills has been an executive with the National Audubon Society.

## **Professor Walery Goetel**

With the death of Prof. Walery Goetel on 6 November, IUCN lost a great friend and long-time supporter.

Professor Goetel took part in the 1948 Conference at Fontainebleau when IUCN was organized and was a member of the first Executive Board. He served as President of the Polish Organizing Committee for IUCN's Seventh General Assembly, held in Warsaw in 1960, and since 1966 had been a member of the International Commission on National Parks.

Professor Goetel played a leading role in conservation in central Europe, pioneering the concept of international parks. The Tatra National Park in Poland and the High Tatra National Park in Czechoslovakia, which are contiguous across the borders of the two countries, and several other parks on the border, stand as monuments of his work.

He was a member of the Polish Academy of Sciences, and a Professor and former Rector of the Stanislaw Staszic Academy of Mining and Metallurgy.

## **Professor Petko Stainov**

IUCN lost another good friend in the recent death of Professor Petko Stainov of Bulgaria, a member of the Committee on Environmental Law, Commission on Environmental Policy, Law and Administration.

Professor Stainov was a Deputy of the Bulgarian Parliament, a member of the Bulgarian Academy of Sciences and a former Minister of Foreign Affairs.

## Book Reviews

Unless otherwise indicated, the reviews in this issue are by Professor Tom Harrisson.

**Commoner, Barry (1972): *The Closing Circle: Confronting the Environmental Crisis*.** London: Johnathan Cape. 336 pp., £ 2.50.

**Ramsay, William & Anderson, Claude (1972): *Managing the Environment: an Economic Primer*** London: Macmillan. 314 pp., £ 3.95.

*The Closing Circle* is the most urgent, most radical and most constructive book yet written on the environmental crisis. These 19 words are the publisher's, on the book's handsome dust jacket. Well... this reviewer has lately read many books on this subject and must beg to qualify Jonathan Cape's strong claim. It is, certainly *one* of the more urgent and constructive; but the radicalism goes somewhat awry – as is usually the case in conservation, where background "philosophy" and principles remain confused or still incompletely formulated, largely just because the whole thing is so newly important, with competing writers naturally seeking to triple-plot their analyses, arguments and conclusions.

This is also one of the best of the *American* books, so far. The adjective (*American*) has reluctantly to be emphasised in this instance. For part of the deep, largely unforced dilemma of our time is that the strongest writing is coming from those countries which are most involved in practises destructive to the present human process. How can the American writer *fully* face, say, the total implications of the continuing internal erosion of basic conservation attitudes (e.g. national parks) or the massive effort deliberately to destroy whole biotypes externally (as with the cover-flora in Indo-China)? To be truly *radical* in this field must lead to appear *unAmerican*, "unpatriotic" and generally unbecoming in one who, like Professor Commoner, is Chairman of his Washington University department (Botany), a member of the Board of Directors of the American Association of the Advancement of Science, and much else in the academic establishment, however "left" as well.

*The Closing Circle* belongs necessarily to one privileged segment of Great Power outlook. Within that enclosed framework, Prof. Commoner goes a long way to and fro and brilliantly says a deal of value up and down. He suggests a reshaping of global policies and technologies, in effect a complete re-vamp for the human race, as the unavoidable basic necessity. He urges: "In any case, both socialist and capitalist economic theory have apparently developed without taking into account the limited capacity of the biological capital represented by the ecosystem. As a result, neither system has as yet developed a means of accommodating its economic operation to environmental imperatives." (p. 281)

He concludes that although "the environmental crisis is necessarily global", yet "The United States holds the key" (p. 291). If one lives in, for instance, Iran, Laos, the Congo, Eritrea or on Easter Island (or even Belgium), it is difficult to accept this view. Nor is it possible to accept, in the terrible complexities of the so-called "under-developed" world, the well stated conclusion that "if we are to survive, ecological considerations must guide economic and political ones" (p. 292). Alas, such considerations are not only indivisible (cf. Commoner's laws of ecology, p. 33) across three-quarters of this globe, but the last two are in the foreseeable future nearly always going to dominate the first. Until we deeply recognise these hard realities, much conservation theory may be little more than sound and fury – and even potentially counter-productive.

The two authors of *Managing the Environment* see these problems at another level, as planning and control experts working inside the American business field. As they put it: "economics and politics (communism vs. capitalism) may have partially replaced race and culture as points of division." Again, this view seems simplistic, the global picture more complex, less dichotomous. Race, in particular, not only remains but is *growing* as a factor over much of three continents; with "fall-out" effects nearly always immediately dangerous to the ecosystem and its planned future use.

The value of this "economic primer" rests, rather, in the emphases upon practical aspects. There are interesting – and provoking – passages on, for instance, the very real importance of re-designed tax structures in "ecosystem regeneration" (Ch. 9, Appendix C on "ecotaxes"). The treatment is at times bitty, the style sometimes irritatingly spry ("societies can count on one hell of an ecological mess" tomorrow, p. 194). But these authors are trying to insert hard, action-working facts into the frequently so-soft thinking of more academic conservation. Perhaps that is why Macmillan's price their smaller book more than 50% higher than Barry Commoner's! Neither are illustrated.

**Heinzel, H., Fitter, R., & Parslow, J. (1972): *Pareys Vogelbuch*.** Hamburg and Berlin: Verlag Paul Parey. DM 16.00. The English edition has been translated by Prof. Dr. G. Niethammer and Dr. H. E. Wolters of the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. Basically it is identical to the English edition; a few footnotes add up-to-the-minute information and the special distribution maps for the United Kingdom have been omitted. It may be that a slightly better quality paper has been used, for the illustrations seem to be a shade clearer.

**American Association of Museums (1971): *Museums and the Environment: A handbook of education*.** New York: Arkville Press. 262 pp., \$(U.S.) 12.95.

This is an authoritative and handsomely produced study, the first of its kind, of the world's present ecological and conservation problems from the museum point of view, prepared by an imposing committee of American museum men. The special feature here is that each subject is first discussed in general, and then treated specifically in terms of exhibits and visual display projects. It is most useful, and as far as the present reviewer is aware, not to be found anywhere else in the literature. Moreover, the richly documented ideas can be used, in simpler forms, by almost anyone mounting an exhibition on conservation matters. After all, the standard of such exhibitions (e.g. during Conservation Year in the Low Countries) has been very poor, so far.

The final chapters deal with the added dimension obtained by the use of films, television programmes, and the emerging role of museums in environmental education. If the claims made under the last of these headings seem rather high, it can only be said that hitherto museums have been backward in this respect. There are vast opportunities for them to participate in conservation education and perhaps in the end have more influence than any body else.

**Smithers, Reay, H. N. (1971): *The Mammals of Botswana*.** Salisbury: The Trustees of the National Museums of Rhodesia. 340 pp., \$(Rhodesian) 10.50.

This is, in effect, a factonomic report by the Director of the National Museums of Rhodesia on an extensive collecting survey, designated the Botswana Mammals Survey, of that territory and some adjacent domains, covering 569,800 km<sup>2</sup>, and conducted with strong support from the Smithsonian Institution, Washington. It adds enormously to our knowledge of this hitherto largely unknown area. As well as describing the survey material directly, it updates all other available information and literature on distribution, habitat, habits and food in all known forms.

The Introduction is strongly conservation-orientated, and one of the prime purposes of the work is to provide the necessary data for conservation programmes. Particularly welcome is the emphasis put on smaller species. As Dr Smithers puts it:

"In Botswana, these smaller species are of immense value and have, from time immemorial, provided food and clothing for the indigenous people. In modern times, hides and skin have become articles of trade of increasing commercial value. The proper conservation of the species, in order that they may be utilised on a sustained yield basis, has, therefore, become increasingly important" (p. 1).

An additional pleasure in this well-prepared volume is the presence of many corrections of error in pen and ink, starting with mistakes in the captions of the first two illustrations and the caption for the first map.

**Dye, Lee (1971): *Blowout at Platform A*.** New York: Doubleday. 230 pp., \$(U.S.) 5.95.

**Clare, Patricia (1971): *The Struggle for the Great Barrier Reef*.** London and Sydney: Collins. 224 pp., £ 2.50.

A reporter for the *Los Angeles Times* describes, not altogether impartially, the big assignment he carried out – Great Blowout Santa Barbara, California, 28 January 1969 – four days after the controversial Walter Hickel had been appointed Secretary of the Interior. The *Torrey Canyon* of North America focussed public attention on pollution to an unprecedented degree.

The book is significant above the level of journalism in that it is well researched, tracing out the enormous power of oil and other capital interests in the United States, and the complex problems involved in controlling such interests. Moreover, as is clear here, there is often a heavy bias in the lesser courts in favour of such interests. Of great interest, also, is the evolution of Wally Hickel himself as traced out in these pages. He began by looking like a pro-oil and big business man. He ended up well to the left on the conservation wing, to be fired by President Nixon at short notice (p. 117) on 25 November 1970.

Despite many difficulties and doubts, the Santa Barbara channel episode has had a powerful effect in North America. If it has not seriously scared some of the entrenched forces, it has checked them on close alert. More than that, it has given a tremendous incentive to the conservation side, an awareness that previous complacency is out of place.

A second book about ocean pollution and related problems comes from an Australian lady journalist, who has thoroughly investigated the problems of her country's major maritime asset. Miss Clare, a platinum blond – Mr Dye is a handsome brunette – is very much influenced by the scientists she met, some of whom are well-known in conservation circles, such as Dr Robert Bustard, Australasia's turtle king.

Miss Clare has some fairly naive ideas (e.g. that the crocodile is a sort of dinosaur; p. 130). She tends, too, as is so often the case in contemporary writing of this sort, to place nearly all the emphasis on the bad side with some feeling of exaggeration. It is a pleasant and interesting book, as well as a useful summary for general situations for the Great Barrier Reef as a whole, 207,200 km<sup>2</sup> of it, between latitudes 10° south and 24° south. The chapter on the pestilent Crown of Thorns starfish (pp. 16–42) is especially good.

**Watters, R. F. (1971): *Shifting Cultivation in Latin America*.** Rome: FAO Forestry Development Paper No. 17. 305 pp., \$(U.S.) 6.25; £ 2.10.

This is an extremely useful addition to the FAO series on shifting cultivation in Africa (Tondeur, dealing with the Congo, and Bergeroo-Campagne with the Ivory Coast, both in 1956), and Asia (Conklin, for the Philippines, 1957).

The author, who is Professor of Geography at the Victoria University of Wellington, New Zealand, and has had previous experience on this subject in the Pacific tropics, was on a special mission in Latin America during the years 1963/64 to study the modalities of shifting cultivation in three countries: Venezuela, Mexico and Peru. The book consists of lengthy extracts from the more detailed reports submitted to these countries.

Shifting cultivation, as presently practised, affects large sectors of the population in practically all tropical countries and represents a very complicated problem. As it is connected with people at a relatively very poor economic level it is generally labelled as very wasteful and destructive. Indeed, the practice is widely condemned by almost all economists, agronomists, foresters, conservationists and others. However, it may be in balance with certain environments as long as populations are not high, and is often associated with worthwhile social habits. It appears to be almost impossible to wipe it out successfully, and the unavoidable question is how to replace this practice, how to intensify land-use and improve the lot of the people involved. This problem is at the root of almost every analysis on this subject and this book is no exception.

As the author notes in his introduction (p. 15): "... when shifting cultivation mainly derives from land hunger, it becomes essential to deal with the overall problem by confronting the causes and getting at the roots of this practice, and by establishing a suitable land-use policy."

The case studies involve regions in the highlands and lowlands of both relatively dry and wet areas. Needless to say, the conditions under which shifting cultivation is practised and the results obtained, vary tremendously. The author went painstakingly into the field to collect data, impressions from the farmers, and his book is full of notes and evaluations, successes and failures, that are skillfully analysed and compared with relevant literature references; the latter, needless to say, are scanty, patchy, often lack objectivity and seldom stand up to careful scientific scrutiny. This makes the author's research the more valuable. In his conclusions and recommendations for Venezuela, one passage (p. 140), for instance, is typical of the complexity encountered: "The problem of overcoming shifting cultivation is partly one of social change... action [must take place] on many fronts, including clearly conceived and implemented agricultural, forestry and conservation policies, which include positive economic opportunities for the campesino, as well as prohibitions and limitations. Credit policies, the promotion of industrialization and urbanization, regional planning, education and further social change are equally vital elements."

More difficult, even, appears to be the problem of inducing changes, as was clearly shown in many of the case studies in Mexico. The Peruvian case studies included both the high 'Sierra' and the eastern Amazonian forests. The whole opening of the wet – and not so wet – eastern forest ('la selva') offers interesting insights into present trends. The author can hardly conceal his scepticism of the potentialities of these vast regions where data are urgently needed for objective appraisals to guide land-use policies.

If backwardness – so often associated with shifting cultivation – is to be eradicated, massive interdisciplinary and comprehensive solutions based on scientific data must be applied. The prospects look dim and the author comments at one stage (pp. 285–286): "In a largely laissez-faire environment, in which unguided market forces determine resource allocation, cumulative movements in regional (and class) income inequalities will persist. This process of 'circular causation' will continue to attract most capital, skilled labour and enterprise to the more productive capitalistic sector, and the traditional sector will continue to be drained of resources needed for its own development, while remaining imprisoned in its vicious circle of under-development." Shifting cultivation as at present practised in the Latin-American countries examined is possibly that: a vivid symptom of under-development.

Gerardo Budowski