

# Abstracts on Sustainable Agriculture

Compiled by Jürgen Carls



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## Deutsches Zentrum für Entwicklungstechnologien – GATE

Deutsches Zentrum für Entwicklungstechnologien – GATE – stands for German Appropriate Technology Exchange. It was founded in 1978 as a special division of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. GATE is a centre for the dissemination and promotion of appropriate technologies for developing countries. GATE defines „Appropriate technologies“ as those which are suitable and acceptable in the light of economic, social and cultural criteria. They should contribute to socio-economic development whilst ensuring optimal utilization of resources and minimal detriment to the environment. Depending on the case at hand a traditional, intermediate or highly-developed can be the „appropriate“ one. GATE focusses its work on four key areas:

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– *Research and Development*: Conducting and/or promoting research and development work in appropriate technologies.

– *Cooperation in Technological Development*: Cooperation in the form of joint projects with relevant institutions in developing countries and in the Federal Republic of Germany.

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GATE has entered into cooperation agreements with a number of technology centres in Third World countries.

GATE offers a free information service on appropriate technologies for all public and private development institutions in developing countries, dealing with the development, adaptation, introduction and application of technologies.

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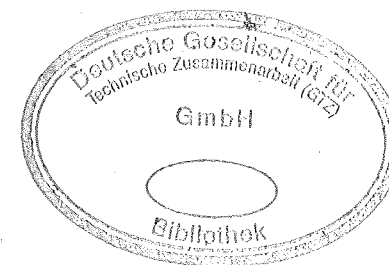
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- provision of materials and equipment for projects, planning work, selection, purchasing and shipment to the developing countries
- management of all financial obligations to the partner-country.

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## PREFACE

This is the first GTZ publication to bear the title "Abstracts on Sustainable Agriculture". The reader who is already familiar with the "Abstracts on Intercropping" may initially be confused by this "new" volume. It is published by the same institution, edited by the same person and has the same basic layout for each individual abstract. Why, the reader might feel justified in asking, has the title been changed?

"Abstracts on Intercropping" grew out of the supraregional intercropping project financed by the German Federal Ministry for Economic Cooperation (BMZ). Once the main objective has been reached the project itself was disbanded, but the Abstracts continued to be published, due to the high, and increasing interest of the users.

We believe that the success of the Abstracts can be attributed to two factors. Firstly, we have made an effort to make them more comprehensive and more detailed than the usual annotated bibliography or computer print-out. We aimed to give the reader sufficient information to enable him or her to use the main results without necessarily having access to the original publication. Secondly intercropping is a subject which has been increasingly capturing the attention of everyone concerned with the development of more sustainable land-use systems.

Intercropping, however, is just one of the many facets of sustainable agriculture, and it has thus been decided to expand the Abstracts to deal with a broader field. To do justice to the new, enlarged subject matter they have been renamed "Abstracts on Sustainable Agriculture". We hope that the Abstracts have a valuable role to play as part of the external input in the drafting of extension programmes. They make no claim however to offer tailor-made solutions. The responsibility for adapting the Abstracts to suit local conditions rests with the reader.

We would like to express our special thanks to the German Federal Ministry for Economic Cooperation (BMZ) for financing the compilation and publication of this edition, from funds allocated to the data project.

Readers interested in the Abstracts are asked in future to adress their request to:

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Editor

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GUIDE TO READERS

Selection of literature for the abstracts has been based on the following criteria:

- Ecological Aspects

- . Sustainability
- . Resource stability
- . Soil fertility
- . Diversity

- Socioeconomic Factors

- . Promotion of smallholders
- . Integrated systems (Animal-Man-Plant)
- . Transfer of knowledge
- . Low-external-input agriculture
- . Sociocultural aspects

- Locational Factors

- . Regional- and site-specific
- . Practice-oriented
- . Alternative uses

The abstracts are set up in the following way:

- (1) Abstract number.
- (2) Principal key-word: traditional land-use systems, cropping systems, agroecology, agroforestry, farming systems research and development etc.
- (3) Key-words: if relevant, the geographical demarcation (continent, country) or the agroecological zone is given; the key words "review", "field trial", "field study" or "farm survey" indicate the nature of the paper; common names of field crops, soil fertility, pests, diseases, socioeconomic aspects etc. are used.
- (4) Author's name.
- (5) Title in the original language.
- (6) Abstract: Because the abstracts are more comprehensive than is normally the case, it may often not be necessary for the reader to refer to the original. In a few cases, the summary by the author was used directly, sometimes because the original work could not be obtained.

The subject index, based on the key-words, and the geographical indices are intended to help the reader quickly find abstracts on specific aspects or areas of sustainable agriculture. The index of authors is intended to help the reader find all publications by a particular author.

## I. TRADITIONAL LAND-USE SYSTEMS

1

88 - 1/1

Traditional land-use systems  
 Asia, Sri Lanka, dry zone, shifting cultivation, soil fertility, fallow periods, cropping system  
 ZIMMERMANN, T.  
 Shifting cultivation in the dry zone of Sri Lanka.  
 In: Handbook for Highland Farming in the Dry Zone, Sarvodaya Rural Technical Services, Sri Lanka, 1, IV-VI, 1981

Chena or shifting cultivation is a widespread farming system in the area of tropical rain- or monsoon forests. Its main feature is the lack of settled farms. Under ideal conditions the plot under cultivation is rotated in a cycle of 10-20 years within a jungle area. In the dry zone of Sri Lanka jungle clearing, burning and fencing of the plot is done between July and September. Cultivation is started with the first rains. Seeds are broadcast on the cleared land and very limited cultivation work is done with mammoties to bury the seed. After sowing little attention is paid to the crop. Most important is permanent watching to protect crops from wild animals (wild boars, birds, elephants). By burning the jungle material, a part of the nutrients enclosed in the living plant matter, especially potash, can be gained for the following crop. Without fertilizer application, cultivation can be continued for 2-3 years. Then the fertility of the soil is exhausted. After this cultivation period the land should be left fallow under jungle for at least 10 years. During this period under natural vegetation the soil fertility is restored and the cultivation process can start again. Chena cultivation is practised in villages of the dry zone of reddish brown earth, often in combination with paddy cultivation under a small tank system.

Chena cultivation is a rewarding cropping system in low populated areas in terms of minimizing farmer's risks and optimizing his labor input in combination with paddy cultivation. The fallow is a cheap method of restoring soil fertility. The jungle clearing work during the dry season does not compete with other cultivation work. The fallow period under jungle eliminates weeds, pests and diseases. The farmer faces less weeding problems than under permanent cultivation. Capital inputs can be reduced to a minimum and only seed material is required.

On the other hand Chena cultivation has caused extensive destruction of forest in the whole dry zone of Sri Lanka. Primary forest is cut and burned and the wastage of valuable timber is tremendous.

Soil destruction takes places very quickly and only on flat land can erosion be controlled to some extent. Yields are always low since there is complete dependence on rain-fall. No Chena farmer is going to practise lift irrigation since