

# Information Systems on Environmentally Sound and Appropriate Technologies

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## Abstract

This paper highlights the genesis of Information Systems on Environmentally Sound and Appropriate Technologies which is sponsored by Ministry of Environment & Forests, Government of India. A brief profile of Development Alternatives is given. Objectives, potential users, and using new information technologies in Information Systems on Environmentally Sound and Appropriate Technologies are mentioned along with the policy of collection of data and information. Brief description of each database created and periodically updated to retrieve data and information to users all over the world is given. Online access to data and information by public from all parts of the world is mentioned by briefly describing DAINET along with future plans.

## 1. GENESIS

Fifty years ago, India attained independence, Rhetoric apart, we have come a long way after breaking the shackles of slavery and have made tremendous strides in various fields like agriculture, industry, science and technology etc. This progress or development, however, took heavy toll of our natural resource base, well beyond its carrying capacity and caused irreversible damage to the environment.

Globally speaking, the first ever UN Conference on Environment in 1972, at Stockholm, warned us about this forthcoming danger and also established the fact that environment and development are two sides of the same coin. And, plundering the Earth's resources could never lead to the sustainable development of mankind.

With this backdrop, Ministry of Environment and Forests, Government of India, decided to establish Environmental Information System

(ENVIS) Centres across the subcontinent to act as communication bridges to reach out to the masses. The basic premise was to empower people through the powerful tool of information by evolving decentralised information paradigm and make them sensitive towards environment.

ENVIS is a decentralised network consisting of a Focal Point in the Ministry co-ordinating the activities of a chain of 24 subject-specific nodes located in various prestigious institutions/organisations all over the country. In the area of 'Information Systems on Environmentally Sound and Appropriate Technologies (ESAT)', the Ministry has selected a prestigious research organisation namely Society for Development Alternatives (for brevity it is known as Development Alternatives) where Information Systems on Environmentally Sound and Appropriate Technologies is located.

Information Systems on Environmentally Sound and Appropriate Technologies was established in 1984 at Development Alternatives, New Delhi. Since its inception it is an integral part of the organisation and works closely with its other branches which develop and disseminate appropriate technologies and institutional systems for sustainable development. A brief profile of Development Alternatives, at this juncture is pertinent.

## 2. DEVELOPMENT ALTERNATIVES: A BRIEF PROFILE

Development Alternatives is a global network of organisations with the objective of generating activities aimed at sustainable development.

Development Alternatives, India, is a non-profit research, development and consultancy organisation established in 1983. It fosters the new relationship in the people, technology and environment interactions needed to attain the goal of sustainable development. It has two branches

(i) **TSB (Technology Systems Branch)**—focuses on designing and developing Information Systems on Environmentally Sound and Appropriate Technologies in close collaboration with the other branches. Several technology packages in Shelter, Domestic Energy, Handmade Paper, Textiles, Pottery, etc. have already been disseminated and others are in various stages of development.

(ii) **ESB (Environment Systems Branch)**—designs environment and development management strategies at various geographic scales and levels of detail. Experimental-cum-demonstration projects are also undertaken in the field. The range of field studies and projects include environmental impact assessment and analysis, environmental management plans, environmental and social policies and procedures for corporate organisations, community development, food security in tribal areas, rehabilitation and resettlement, pollution prevention, cleaner production, waste management, natural resources management

using geographical information system (GIS) & remote sensing, income generation through microenterprises, and biodiversity conservation.

Besides R&D workshops, support is also drawn from a well equipped computer unit—an accredited Information Systems Unit, Communication Unit and Geomatics Facility. The Environmental Monitoring Facility can undertake soil, water and air analyses.

The regional office in Bangalore in the past eight years of its operation has built up considerable expertise in the field of low-cost construction using appropriate technologies and local materials as well as income generation activities. This regional office looks after the operations in Karnataka and other Southern States.

The regional office in Jhansi looks after the operations in Bundelkhand region. It has shown excellent results on ground during the past four years in wasteland development, natural regeneration, soil & moisture conservation, community irrigation systems and income-generation activities.

An 'Appropriate Technology Centre' is being established in Orcha (TARAGram), Madhya Pradesh. This Centre is a unique experiment in design and dissemination of appropriate technologies in the Bundelkhand region.

A field station is now operational in Tumkur, Karnataka to take up wastelands regeneration and Watershed management in the region.

Affiliated institutions of Development Alternatives, namely TARA (Technology and Action for Rural Advancement), TNK (Tara Nirman Kendra), DESI Power (Decentralised Energy Systems India) produces and market a range of environment friendly products, such as building materials handmade paper, handloom and renewable energy systems.

Information Systems Unit of Development Alternatives is designated as Information Systems on Environmentally Sound and Appropriate Technologies.

## 3. OBJECTIVES

Information Systems on Environmentally Sound and Appropriate Technologies has

organised and developed an automated library and information system to disseminate information on information systems on environmentally sound and appropriate technologies and related subjects to both internal and external users. Right from its inception, this ENVIS centre is playing an important role in exchange of information and providing relevant information both in anticipation and on demand to both internal and external users.

The objectives of Information Systems on Environmentally Sound and Appropriate Technologies are listed below:

- (a) Designing and organising user oriented and automated Information system;
- (b) Retrieving relevant data and information in user friendly way;
- (c) Providing data and information support to research and action aimed at sustainable national development;
- (d) Disseminating information globally through networking;
- (e) Sharing the resources; and
- (f) Evolving better methodologies and techniques for retrieval of relevant information to the users, efficiently.

Right from inception, professional staff members of Information Systems on Environmentally Sound and Appropriate Technologies are giving paramount importance providing the needed data and information to both internal and external users efficiently.

#### 4. POTENTIAL USERS

Appropriate technology designers, government agencies, NGOs, small scale enterprises, research workers, decision makers, academicians, students, social scientists, media persons and other persons who are interested in Environmentally Sound Technologies, Environmental Management and Sustainable Development are the potential users of ENVIS.

#### 5. COLLECTION OF DATA AND INFORMATION

Collection of relevant data and information, has started almost simultaneously right from the inception of Development Alternatives which is recognised as a research organisation by the Ministry of Science & Technology, Government of India.

When Information Systems on Environmentally Sound and Appropriate Technologies was established in 1984, the policy of procurement of documents was

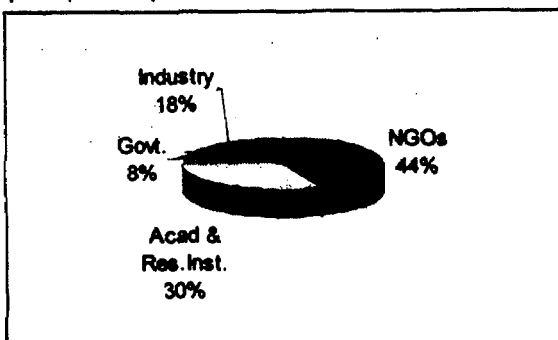


Fig. 1. Query Response (Sectorwise) (1997-98)

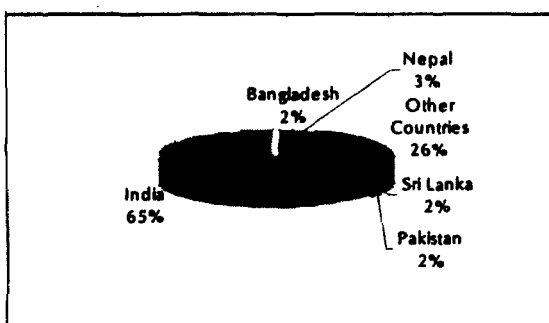


Fig. 2. Queries (National and International 1997)

mainly restricted to hard copies which was prevailing during those days. But, with the advances in technologies, especially in electronics, the policy of collection of relevant data and information has been broadened to cover not only hard copies, but also diskettes and CD-ROMs. This change became necessary, over the years, to make Information Systems on Environmentally Sound and Appropriate

Technologies as a partly electronic library and partly library of hard copies, at the dawn of 21st century. We took this decision, based on our experience in observing the physiology and psychology of users of Information Systems on Environmentally Sound and Appropriate Technologies. Because, still majority of users prefer hard copies to electronic media. However, this trend is likely to change in the coming years, since relatively new sources of information, such as online access, diskettes and CD-ROMs are becoming popular, gradually.

Resources of relevant data and information of Information Systems on Environmentally Sound and Appropriate Technologies is given below:

## 6. RESOURCES

Resources available with Information Systems on Environmentally Sound and Appropriate Technologies for 1997-98 are as follows

Books	12,152
Newsletters & Journals	360
Annual Reports	276
Conference Proceedings	315
Reprints of Articles	2100
DA Project Reports	400
DA Project Proposals	360
Maps & Atlases (National & International)	1215
Standards & Specifications	105
Slides	9150
Audio Cassettes	500
Video Cassettes	460
CD-ROMS	75
Diskettes	545

It is interesting to note that Information Systems on Environmentally Sound and Appropriate Technologies is also housed in a building which is built by environmental sound building materials, such as compressed earth blocks which are the products developed by a research team of Development Alternatives.

Development Alternatives's policy of collection of data and information, also covers the procurement of useful reference books,

especially statistical documents either in exchange to our publication or gratis from several organisations, such as United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Children's Fund (UNICEF), United Nations Industrial Development Organisation (UNIDO), The World Conservation Union (IUCN), International Institute for Sustainable Development (IISD), International Institute for Environment Development (IIED), The World Bank, Worldwatch Institute, GATE/GTZ (Germany), SKAT (Switzerland), Ministry of Environment and Forests, Government of India and Tata Energy Research Institute (TERI), in addition to procurement of useful documents, from time to time.

For instance, about 3000 copies of our monthly newsletter, titled *Development Alternatives* are mainly sent as gratis and a few on exchange-basis, just to disseminate information on Environmental management (EM) and Environmentally Sound Appropriate Technologies (ESAT).

## 7. USE OF NEW INFORMATION TECHNOLOGIES

Advanced Information Technologies are boon for producing, organising and analysing data and information.

Databases are created and periodically updated as and when we constantly add documents to our existing resources, to keep abreast with latest information and data in each subject in which we are interested. Two computers, viz.—(i) PC PentiumPro and (ii) PC/AT are used as hardware for this purpose. CDS/ISIS ver 2.3 & 3.0 software developed by Unesco works on Windows platform.

## 8. DATABASE DESIGN AND DEVELOPMENT

The database of documents is created and updated by using CDS/ISIS software.

After accessioning each document, it is catalogued by using standard coding sheet. Then it is classified according to UDC (BS 1000M), 2nd edition, 1993. Keyword indexing

### Features of CDS/ISIS 2.3

- ★ Variable field length.
- ★ Menu driven information storage and retrieval system.
- ★ Suited to structured non-numerical databases.
- ★ Integrated user and system programmes.
- ★ Capacity to contain over 16,00,000 records in a single database.
- ★ Record linkage facility in a given database.
- ★ Display format of 4000 characters.
- ★ Optimised file distribution.
- ★ Improved and enhanced data integrity.
- ★ Extension programming facility in CDS/ISIS Pascal Language.

is done, so that thought content of each document is fully represented by required number of keywords and this has enabled us to retrieve information efficiently to users, at faster rate. For vocabulary control while keyword indexing, we use a thesaurus, titled *EnVoc: Multilingual Thesaurus of Environmental Terms*, brought out by UNEP, in May 1997.

### Common Communications Format (CCF)

- ★ Structured format for computer readable bibliographic records.
- ★ Detailed and structured method for recording mandatory and optional data element.
- ★ Ease of record exchange between computer based system.
- ★ Provision to build in-house, CCF compatible format.

Retrieval of information from this database is several times faster and efficient when compared to manually operated libraries and information systems which depend on age old catalogue cards and catalogue cabinet.

Since the search commands in CDS/ISIS software are efficient, when the user approaches for information she/he mentions the specific subject(s) in which information is required. The database is searched by a keyword or all possible keywords to find all

available documents on each specific subject. Since documents are arranged in a classified sequence according to UDC, needed documents are made available to the user, quickly.

Apart from this, professional staff members of Information Systems on Environmentally Sound and Appropriate Technologies, while providing reference service to the users, also provide additional documents which are also sources of relevant data and information.

## 8.1 Database of Remote Sensing and Geographic Information Systems

A database of micro documents of Remote Sensing and Geographic Information Systems (GIS) is created and updated. Geomatics facility of Development Alternatives is used for decision making on sustainable development issue in the areas of (i) Rural Environment Systems Applications; Industrial and Urban Environment Systems Applications and (iii) Biodiversity Conservation Systems Applications. This database provides data and information on these subjects.

## 8.2 Database on Waste Management

A database of micro documents of waste management is created and updated.

## 8.3 Database of Selected Papers

Database of selected papers/articles from periodicals and conference proceedings which are available in Information Systems on Environmentally Sound and Appropriate Technologies and in the libraries of two organisations which are gladly sharing resources of information and data with Development Alternatives, is created and periodically updated. These organisations are: (i) Tata Energy Research Institute (TERI) and (ii) Sapru House Library. Since Information Systems on Environmentally Sound and Appropriate Technologies is giving equal importance in providing right information and data, to right persons at right time to two types of users, viz. (1) users from different parts of India and occasionally from abroad and (2) users from Development Alternatives and affiliated institutions, this database is very much useful.

Because, in spite of the best available resources, no Environmental Information System in the world can always provide needed information and data to its users from its resources. Whatever is not available from its resources, can be obtained by several ways, such as: (1) Inter library co-operation and (2) Online access to information and data, without any geographical barrier.

## 9. INFORMATION SERVICES

From the very beginning, emphasis has been placed on the providing information services to keep the professionals, policy makers, planners etc. abreast of current developments in the field of appropriate technologies and sustainable development. The information services are as follows:

- Reference services
- Referral services
- Conference alert
- Database service
- Current awareness service
- SDI service
- Press clipping service
- Reprographic service.

Resources of Information Systems on Environmentally Sound and Appropriate Technologies are found useful and constantly used by atleast 100 specialists from different parts of India and abroad, every month, in addition to our specialists. We also retrieve relevant information either by e-mail or fax or telephonic queries or letters from more than 2500 organisations and individuals, all over the world.

Information Systems on Environmentally Sound and Appropriate Technologies is a fully user oriented Information systems unit. Both internal and external users are getting the needed data and information from databases efficiently, with the help of professionally qualified persons.

In case of external users, they are visiting Information Systems on Environmentally Sound and Appropriate Technologies constantly and they are making use of resources, free of cost. They are always welcome and treated at par

with internal users to facilitate them to get information quickly, during working hours. In this respect, Information Systems on Environmentally Sound and Appropriate Technologies is a special library (as per the terminology prevailing in western countries) when its organisation is concerned but it also functions as a public library when its utility to public is concerned.

### 9.1 Query Response Services

On an average, the Information System Unit attends to approximately 2500 queries from a variety of sources like AT Designers, NGOs, research institutions, local enterprises and govt. agencies. Moreover, the Unit acts as switchboard to connect users with appropriate sources of environment information.

### 9.2 Networking

Networking is a concept which encompasses research co-ordination, human resources and the synergy of research and technology communities across the national international boundaries.

As a Distributed Information Centre (DIC) in the ENVIS (Environmental Information System network, the unit expects to be able to contribute and benefit greatly from the improved environmental information flow which is being generated. The system will make full use of information provided by following national and international organisations:

<b>National</b>	<b>International</b>
CII	GATE/GTZ
HUDCO	Worldwatch Institute
IITD	World Resources Institute
IRMA	UNDP
MCRC	SKAT
MoEF	Earth Council
TERI	IUCN
WWF	IISD
	The World Bank
	UNEP
	IIED
	ELCI

### 9.3 Database of Addresses

Users of Information Systems on Environmentally Sound and Appropriate Technologies, periodically ask for addresses of organisations and individuals. Hence, a database of more than 8000 addresses is created and updated periodically. Wherever, telephone numbers, fax and e-mail codes of organisations and individuals are available, the same is given along with addresses.

For retrieving efficiently, addresses are classified under broad areas as listed below:

- United Nations Organisations
- Government of India and State Governments
- Foreign Government Departments
- Embassies/High Commissions
- Funding Agencies
- Educational/Research Institutions
- Industries and Business Houses
- NGOs/ Voluntary Organisations
- Consultants
- Associations
- Media
- Printers & Publishers
- Book sellers
- Travel Agencies

### 9.4 Newspapers Clippings

Data and information on Environmentology, published in newspapers is very important for users of Information Systems on Environmentally Sound and Appropriate Technologies. Hence, newspapers clippings are maintained by scanning daily and selecting relevant information from six newspapers as listed below

1. *The Hindustan Times*
2. *The Times of India*
3. *The Economic Times*
4. *The Hindu*
5. *The Indian Express*
6. *Nav Bharat Times (in Hindi)*

### 9.5 Development Alternatives Information Network (DAINET)

Development Alternatives is ahead of time, in our country, by starting the retrieval of relevant data and information to the entire world, constantly, through DAINET and a brief description of the same given here.

The independent sector needs timely, useful and reliable information for decision support. A large part of this information, though available, is not easily accessible to them.

Development Alternatives is in a position to provide a leadership role in bridging this information gap, by facilitating the independent sector organisations to have access to information by adopting the latest advances in information and telecommunication technology. DAINET would essentially consolidate and considerably upgrade the information products, services and facilities currently being offered to Independent sector organisations. It would make relevant information available fast and in a user-friendly form for sustainable development effort.

### 9.6 Services Currently offered by DAINET

- Electronic mail
- File transfer
- Conferencing
- Database
- Geographic Information System (GIS) facilities

#### Electronic Mail

With DAINET's e-mail, users can exchange messages and files with e-mail users anywhere in the world.

The offline nature of this communication technology adopted by DAINET is well suited for Indian conditions where line quality is poor. All mail composition work is done without engaging the phone line which is only used for mail transfer to and from the server. The actual connect time for an average mail transfer (about 10 KB) is less than half a minute which makes this system economical even for users dialling on STD lines.

## File Transfer

Users can exchange software files, e.g., on MS-Word, PageMaker, Lotus, dBase etc.

## Conferencing

A series of conferences on common topics of interest can be created and accessed by user groups on the network. As part of a conference a user can access and post recent changes to it. Users can also access Usenet newsgroups which are available on Internet.

## Database

DAINET has published a comprehensive NGOs Directory of India, which is titled as DAINET NGO Directory in 15 volumes. Salient feature of this publication is that this gives full profile of each NGO in each state of India by covering its address, telephone numbers, fax, e-mail, contact person, two key persons, year of establishment, year of registration, FCRA, Registered under working languages, geographical area of operation, active in, branch locations, parent organisation and location, approximate annual budget, sources of funds, aims, staffing pattern framework of activities and collaboration, products & services. This has been published in English. This directory will be available on diskettes and also on CD-ROMs by December 1998.

DAINET has also published another useful directory, titled *DAINET Funding Sources Directory* which gives details of funding schemes of each donor agency.

Other databases include a wide range of products and customised information services like Topic Specific Bibliographies (TSB), Current Awareness Services (CAS), Selective Dissemination Information (SDI), Fact Sheets, Conference Alerts, etc.

The client could access this information either online or off line by using the state-of-the-art communication software supplied by DAINET.

In addition, DAINET will provide a communication software package. Technical support would be made available for installation and training.

## 10. FUTURE PLANS

- (a) Further enriching resources of Information Systems on Environmentally Sound and Appropriate Technologies, if additional funds are granted by funding agencies, to make this more and more useful to the public, all over the world;
- (b) Adopting latest technologies, especially in the fields of electronics, telecommunication and global networking, from time to time, not only for the tasks of organisation synthesis of Environmental Data and Information, but also retrieving data information efficiently to the users all over the world, both in anticipation and demand.
- (c) Creating and updating of databases of the data and information generated by Development Alternatives, such as database of about 400 research reports publications.
- (d) Sharing resources with like minded organisations and individuals;
- (e) Housing Information Systems on Environmentally Sound and Appropriate Technologies in a well furnished and big building to accommodate more and more number of users; and
- (f) Human Resources Development by way of deputing professionals to refresher courses periodically, promoting them periodically and also recruiting right professionals.
- (g) Disseminating Information through Internet and Delhi Library Network (DELNET).

## 12. CONCLUSION

Relevant data and information on environmentology is not only needed by researchers, specialists, technologists, decision-makers, industrialists, academicians and students, but also by every citizen of the world, from time to time, to determine whether the environment in which she/he lives is safe. For instance, whether the geographical area where a person lives is free from air and water pollution, after allowing tolerable limits of these pollutions. Hence, Ministry of Environment and Forests and ENVIS Centres have to play important roles in (i) collecting; (ii) organising; (iii) synthesising; (iv) sharing and (v) disseminating relevant data and information



environmentology, sustainable development, environmentally sound appropriate technologies and related subjects, constantly.

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