The Abdus Salam
International Centre for Theoretical Physics

United Nations
Educational, Scientific
and Cultural Organization

International Atomic
Energy Agency

Workshop on "Physics for Renewable Energy"
October 17 - 29, 2005

301/1679-30

"Integrated Renewable Energy Systems"

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Salah Arafa

INTEGRATED RENEWABLE ENERGY SYSTEMS {IRES}

SUN RAYS

Cosmic Rays Ultra-Violet Visible Infrared

Photosynthesis

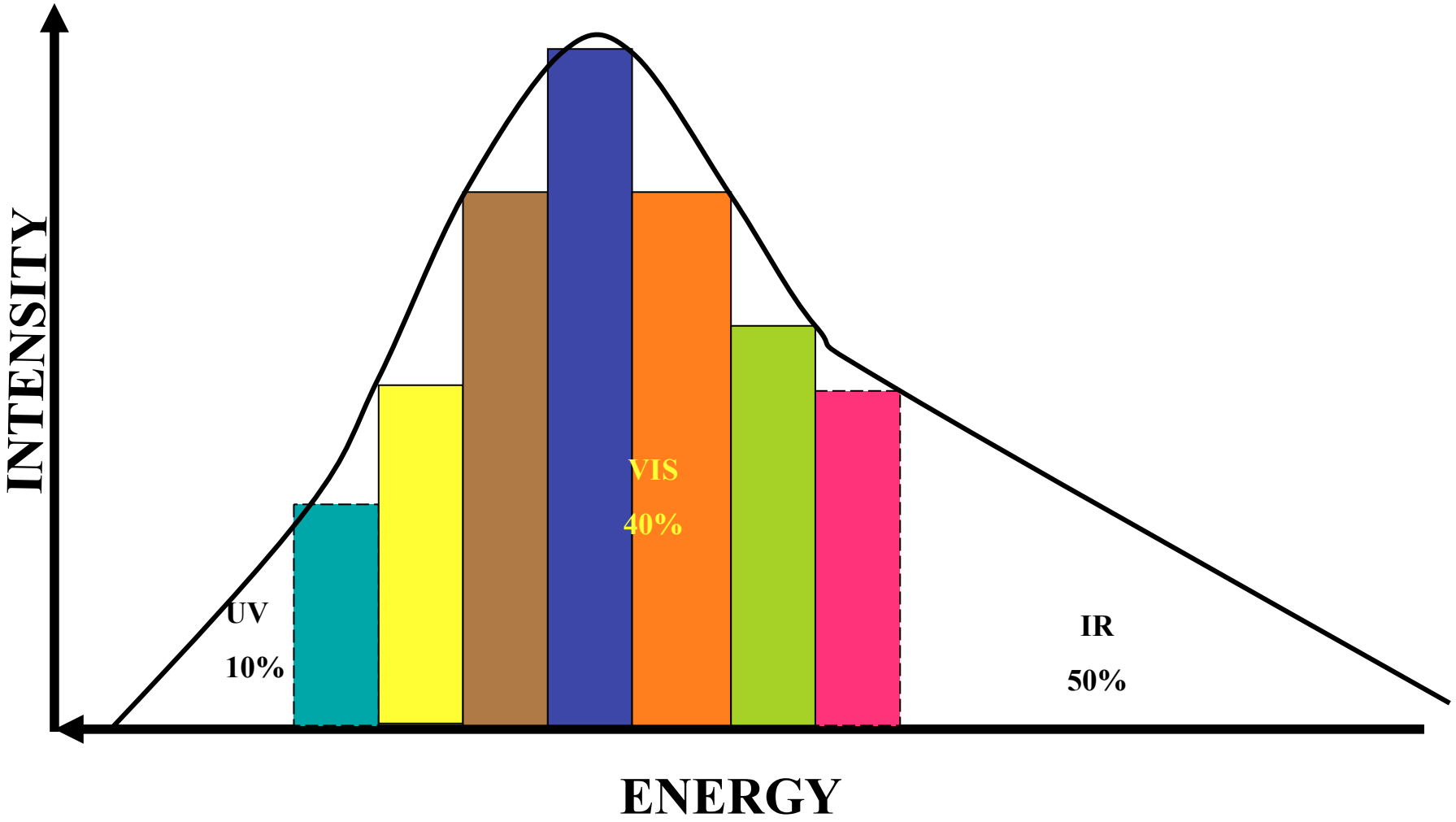
PLANTS ANIMALS

HUMANS

Heat Light Electricity Fertilizer Materials

TECHNOLOGIES

SOLAR RADIATION



SUN RAYS

HUMAN ENERGY

ANIMAL ENERGY

BIOENERGY

CONVENTIONAL ENERGY

NUCLEAR ENERGY

RENEWABLE ENERGY

A Prerequisite for
Sustainable Community Development
is an Educated,
Well Informed, and Technically Skilled
Citizen,
Who lives in a Healthy
And
Democratic Environment.

A Key to Development is Understanding;
Understanding Culture, People,
Technology and Human Needs.

A Means to Understanding, hence a
Means to Development,
is the Sharing of Information
Regardless of
Social or Professional Status.

QUESTION ?

CAN THE SCIENTIFIC AND TECHNOLOGICAL KNOWLEDG AVAILABLE TODAY BE USED TO MOBILIZE THE MAJORITY RURAL POOR IN APPROPRIATE WAY, UTILIZE LOCAL AVAILABLE RESOURCES WITH HIGH EFFICIENCY, TO HELP AND ASSIST IN COMMUNITY DEVELOPMENT, SOCIALLY, ECONOMICALLY, TECHNICALLY, AND CULTURALLY ?

YES WE CAN !.

BUT THE ONLY REASONABLE APPROACH IS TO GAIN A REAL UNDERSTANDING OF THE LIFE AND NEEDS OF THE PEOPLE

IN VILLAGES LIKE BASAISA.

Any attempt to seek technological solutions to rural community energy and poverty problems Must see the problem as an integrated one.

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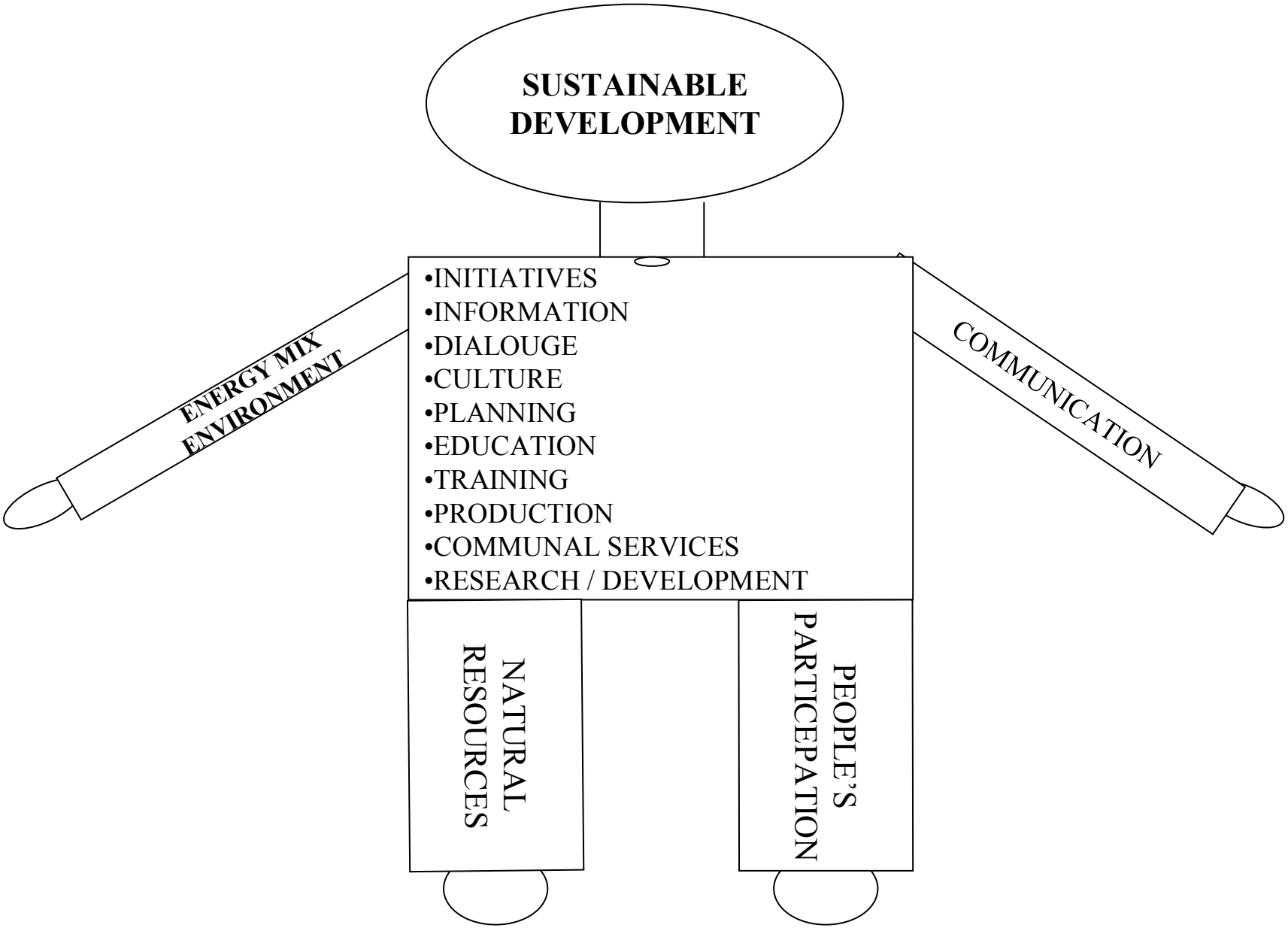
The mere supply of the hardware of alternative energy technologies itself rarely forms a sufficient condition for the reduction of poverty which is the central issue of rural community development.

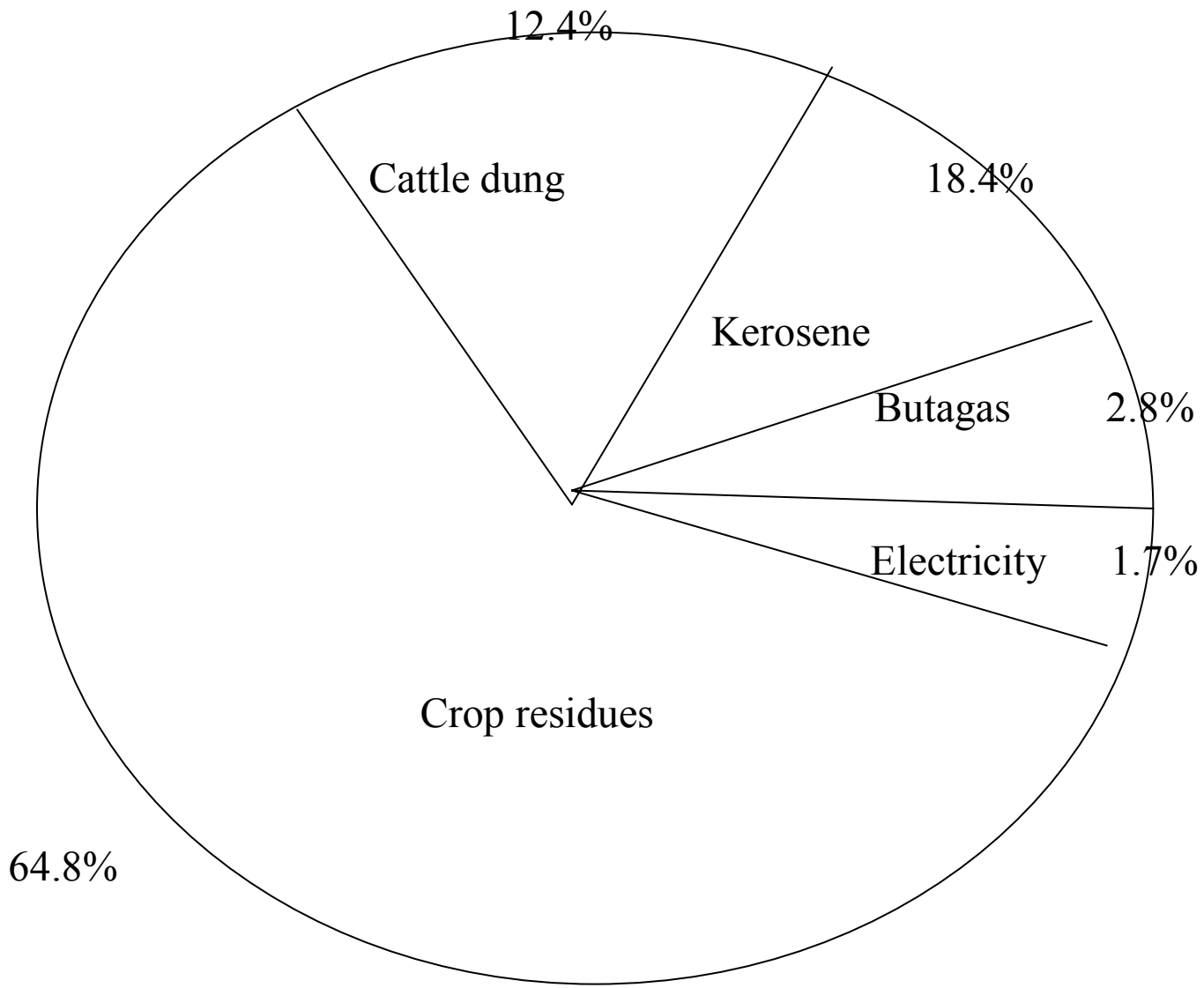
From its inception, the Basaisa Village Integrated Field Project was based on Three Fundamental Premises:

*** People's participation and active involvement in • Whatever is going on in their Community;•**
*** Appropriate approaches to the utilization of local• natural resources; •**
there are few available solutions to the energy problem, • each has its specific Social,
Economic and Technical problems,
one should look for an intelligent mix.
*** Applying the cooperative rules in Production, Services, • and Marketing•**

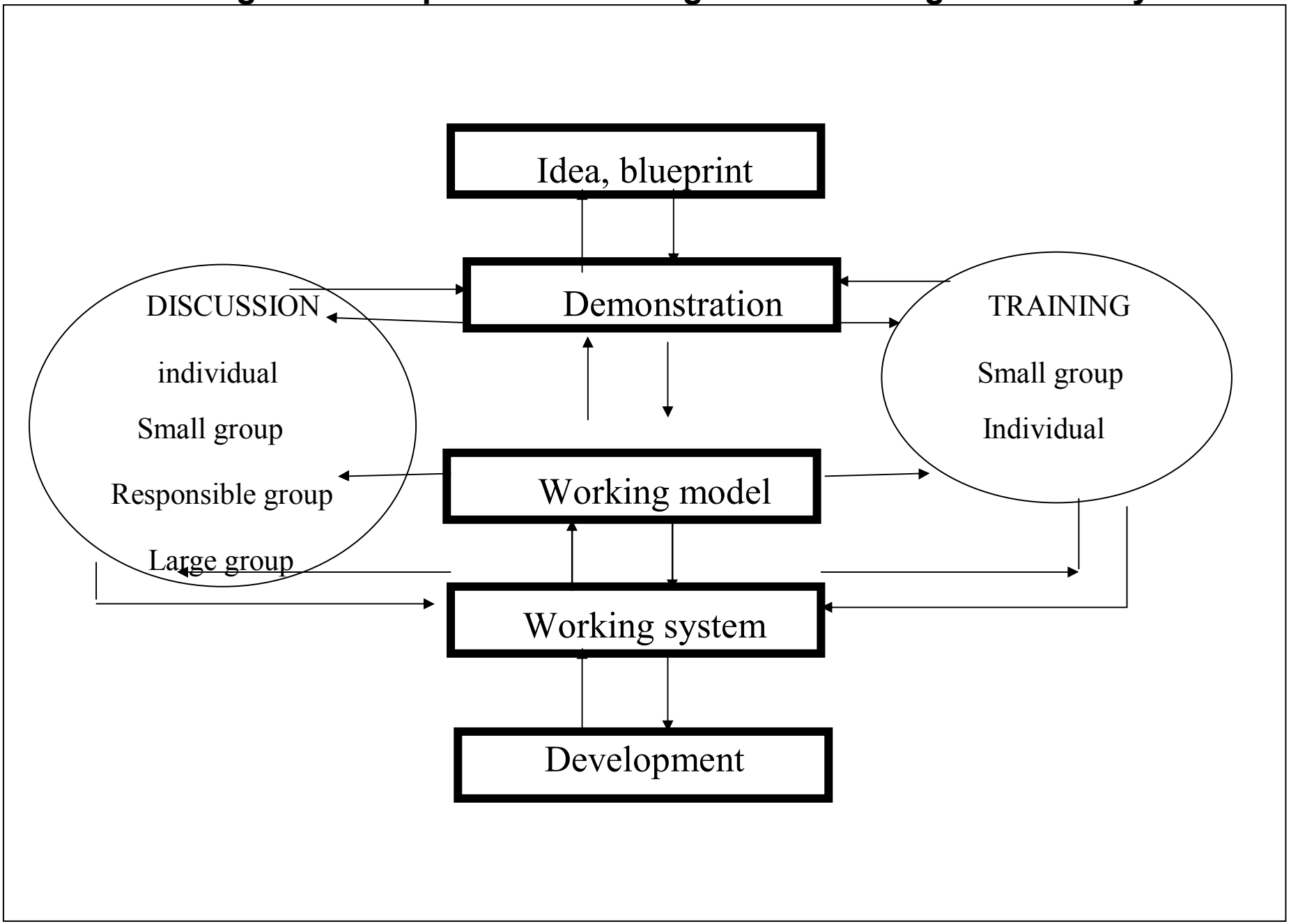
MAN, ENERGY, ENVIRONMENT, AND SOCIETY


SUSTAINABLE DEVELOPMENT
•INITIATIVES
•INFORMATION
•DIALOUGE
•CULTURE
•PLANNING
•EDUCATION
•TRAINING
•PRODUCTION
•COMMUNAL SERVICES
•RESEARCH / DEVELOPMENT
ENERGY MIX
ENVIRONMENT
COMMUNICATION
NATURAL RESOURCES
PEOPLE'S PARTICEPATION

The components of per capita gross energy consumption from both conventional and non-conventional sources in rural Egypt.



A schematic diagram showing the general methodology used by the project for introducing new or improved technologies to the village community.



INTEGRATION

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MULTIFUNCTION

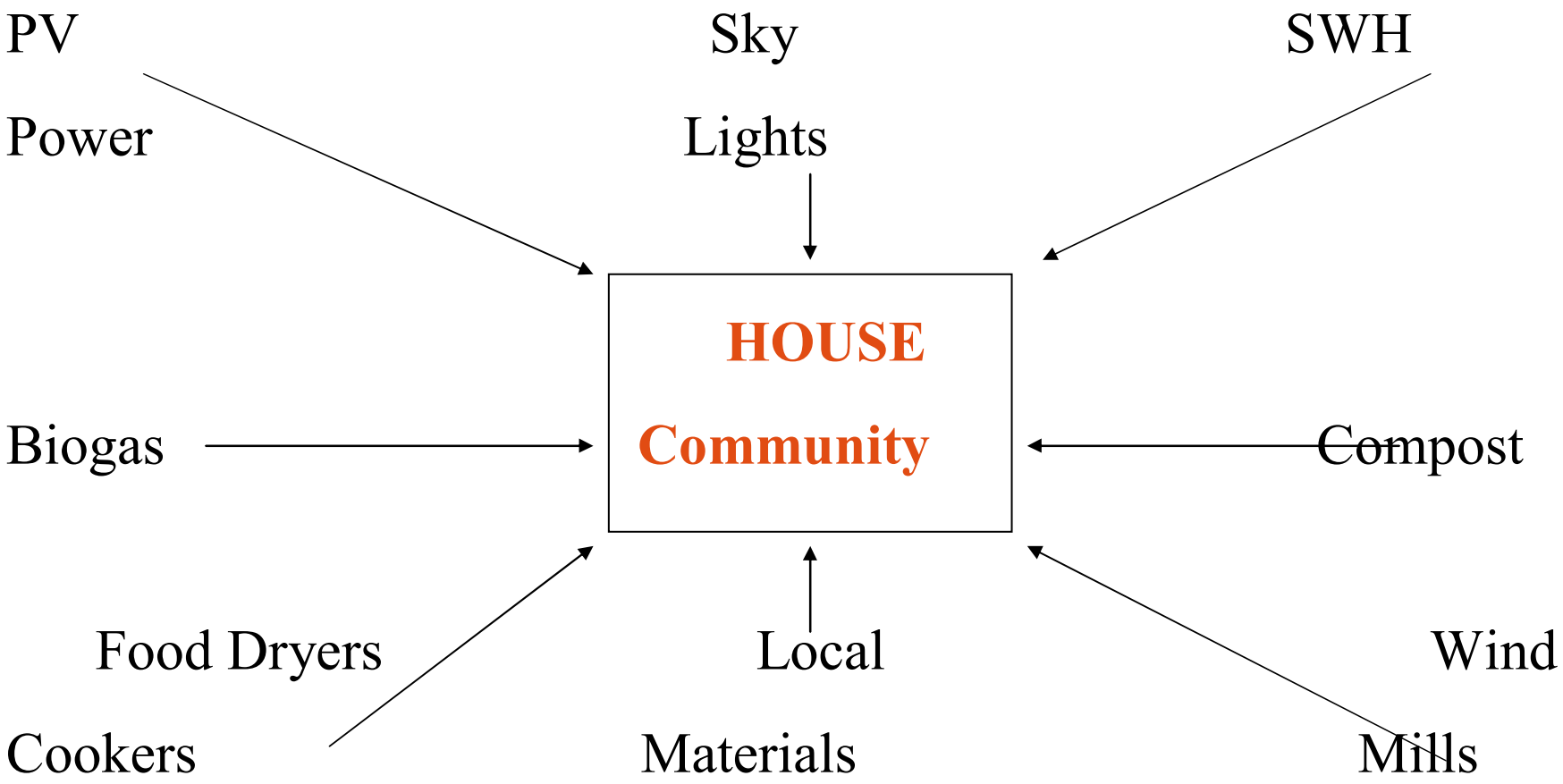
***

EFFICIENCY

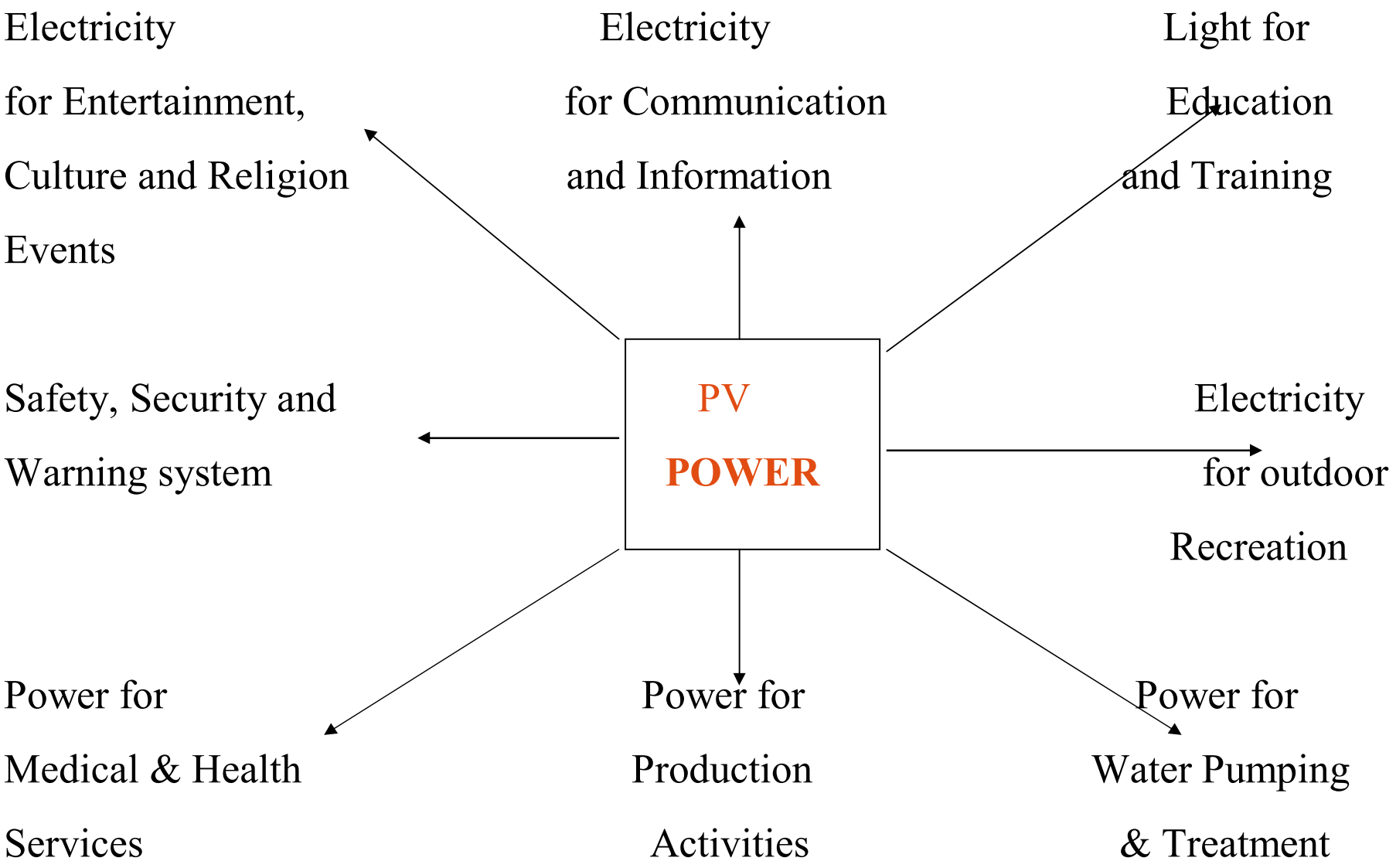
***

CONSERVATION

INTEGRATION OF TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT



INTEGRATION OF ACTIVITIES FOR SUSTAINABLE DEVELOPMENT



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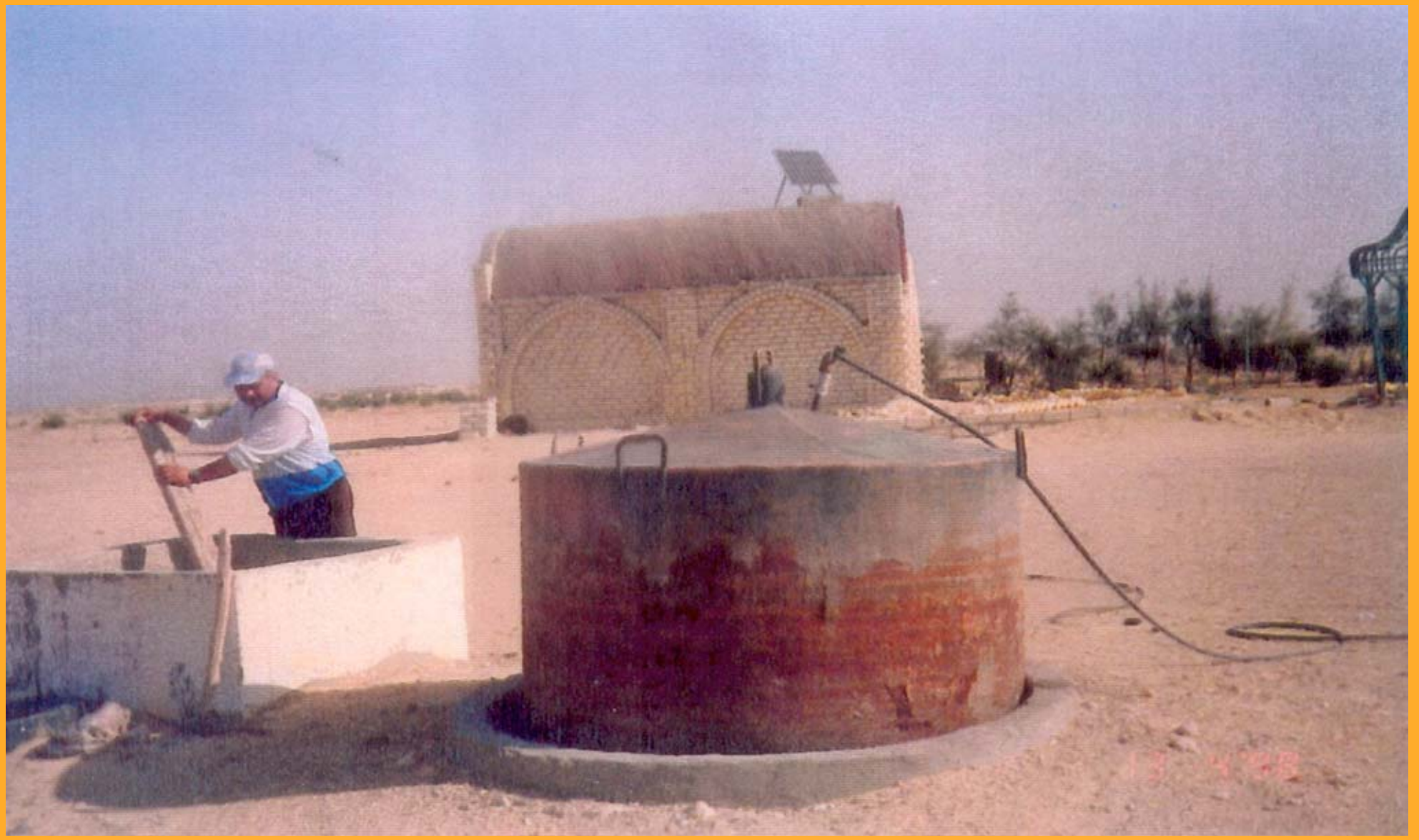
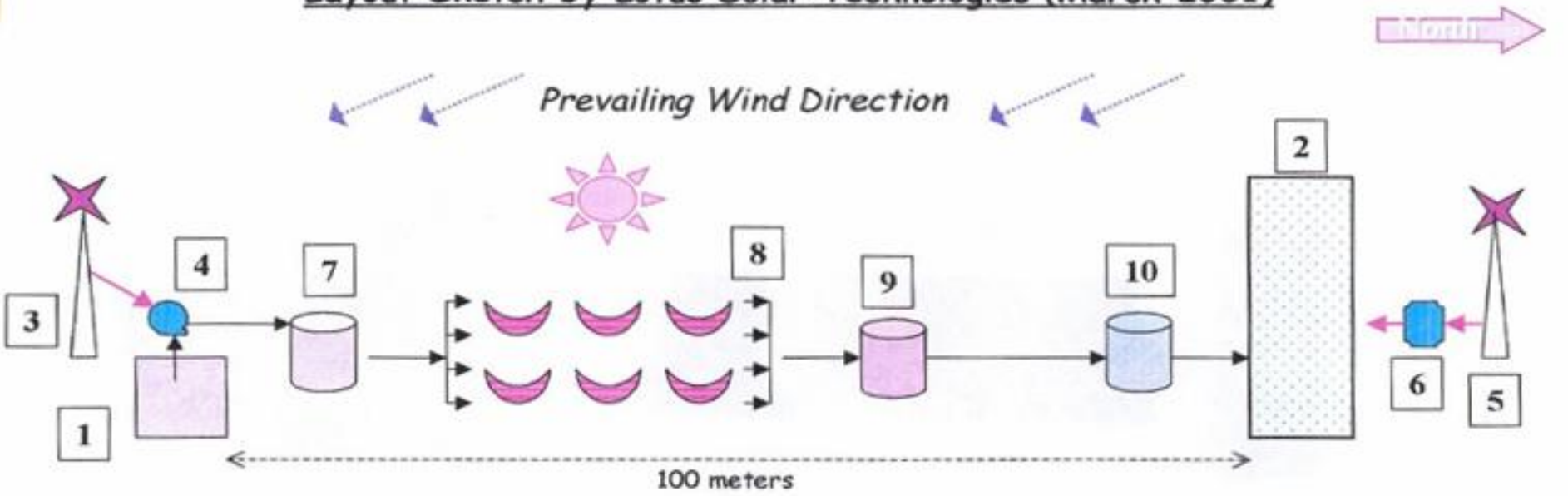


Integrated Solar & Wind Desalination & Electricity Generation Project at New Bassaiyessa
Layout Sketch by Lotus Solar Technologies (March 2001)



· Existing Facilities :

1. Water well
2. Community building

· Phase-1 Facilities :

3. First wind electric generator 1,000W* 3Phase 240VAC
4. Submersible pump 560W 15m3/d
5. Second wind electric generator 400W* 12VDC
6. Power inverter 1,500W 12VDC/240VAC

· Phase-2 Facilities :

7. Feed water storage
8. Solar parabolic troughs
9. Distillation unit
10. Fresh water storage

(*) at 12 m/sec wind speed