Biotechnology

(1) A series of developments including bio-processing, micro-biological enrichment of cellulosic wastes and genetic engineering associated with the term "biotechnology"

(2) Information technology including computer application, telecommunication and mass media, making timely assistance to rural populations with appropriate information

(3) Space technology including weather satellites, remote sensing and conservation monitoring systems

(4) Micro-electronics
(5) Technology blending
(6) Management technology which

can help to foster decentralised production supported by key centralised services

Cohen — There is a lot of gender, not much technology and little development.

The obvious starting point is to build on the traditional strengths of women in agriculture and at the same time introduce new opportunities and skills, particularly for those who have no assets. Women's traditional role in agriculture has been in four broad areas

First, Seed management

Second, crop / livestock Management

Third, Energy Management — Crops, Soil, Domestic needs

Fourth, Post harvest Management

Orienting technology development to the needs of women would generally help both men and women. The reverse however will not be true. Small farmer analogy

Build on strengths rather than brood over past failures

Needs: Flexibility in time, duration and place of work

converting unskilled jobs into skilled ones; thereby reducing drudgery and improving productivity and efficiency.

New Frontiers in diversification of opportunities for employment

Modern Technologies: (a) Decentralised production

(b) greater opportunities for the growth of purposeful Services Sector

Biotechnology
Information Technology
Space Technology
Micro electronics
Management Technology
Technology Blending

and Rural and Agricultural

Role of Women's Universities

Rural Resource corps of young professionals — (Inventory of opportunities)

Reorientation of Home Science Colleges to stress on the productive role of women. — including change in name.

Re-orientation of TRYSEM.

Minimum Needs Program — Access to Technology,

Training Rural Women for Skilled Employment

Environment & Women

Topic III The physical determinants of world economic activity: Environment and Energy

1. Energy for agriculture: Biological and farm grown inputs
2. Biological Diversity: eg. Hainan Island
3. Environmental Awareness: Educational programmes.

Environmental Awareness: Dependence & Inter-dependence

I At this meeting, the word interdependence has been a recurring refrain. ~~Intends~~ The concept of interdependence to be meaningful for lasting human happiness should extend to the earth which makes life possible. We need not just an Industrial Society or Information Society but a Conservation Society. The greatest Challenge is to get this message across to all sections of the Society. Environmental awareness has to be generated from the school stage onwards. We need a movement

for people's involvement in the conservation and management of their life support systems.

We have a charter for Nature approved by the U.N. General Assembly in October 1982 at the global level. What, however, will be meaningful will be a charter for Nature at the local level, developed by the local community itself. Such a Charter should spell out how the local soil, water, ~~flora~~, plant, animal and atmospheric resources can be managed and utilised on a sustainable basis.

II Biological Diversity

China's great heritage is its rich biological diversity. The Hainan Island, for example, is the home of many valuable genes, eg. WA cytoplasm in rice which led to the development of hybrid rice

Genetic engineering is meaningful only if there are useful genes which can be transferred across sexual barriers. A national policy for the conservation of biological diversity ranging from natural Biosphere Reserves and Heritage sites to DNA libraries is a must for ensuring that present and future generations profit from this priceless genetic heritage.

III Energy for Sustainable Agriculture.

The dimensions of the agricultural tasks for the remaining years of this century outlined yesterday by Premier Li Peng Prof Ma Hong, ~~exist~~ Minister He Kang are vast. Their energy requirements are great. China has a rich tradition of organic recycling and use of bio fertilizers like Azolla. I hope China will spearhead a movement for improving

Lester Brown
1950 - 0.4 barrel oil equivalent per ton of grain
1984 - 1.2 barrel oil equivalent per ton of grain

4.

predominantly
agricultural productivity through the use of
farm grown biological inputs and the
use of ecologically sound pest
management. We need both of measurement
for ecological
making sustainability as the
basic norm of all agricultural
development projects.

M. S. Swaminathan Research Foundation

Centre for Research on Sustainable Agricultural and Rural Development

Research Priorities and Strategies

The major goal of the Centre is the development of technologies that can enhance on an ecologically sustainable and economically viable basis, opportunities for skilled employment and income generation in rural areas. Youth and women will receive particular attention from this point of view, because the major challenges facing us today in villages are the flight of educated youth from the villages and the low and uncertain incomes and enormous drudgery of women.

Technologies that respond to these challenges must be knowledge intensive, replacing unskilled jobs with skilled ones. They must lead to diversification of labour rather than its displacement. In addition, they must be ecologically sound, in order to safeguard the interests of our children, grand children and generations yet to come.

Working towards these social and technological goals, the centre will give priority attention to the following areas of research and training.

(a) Integration of traditional technologies (both agricultural and agro-industries) with frontier technologies, such as biotechnology, information sciences and space technology.

(b) Undertaking with the participation of small farmers and fishermen and their families a rural systems research programme, giving concurrent

attention to the primary, secondary and tertiary sectors of economic activity in the villages.

(c) Initiating research on the likely impact of ocean warming and global climate change on the agriculture and livelihood security of coastal and rural communities of Tamil Nadu

(d) Developing methods which will ensure that new technologies reach the unreached and that the rural poor benefit from technological advances

(e) Undertaking training and trainers' training programmes and development of educational resource material

It is proposed to initiate the research and training activities as soon as the requisite land and other facilities become available.

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appropriate non-governmental organisations.

(b) The current FSR approach will be modified in order to become truly integrative in terms of crop husbandry, animal husbandry, fisheries, forestry and production and post-harvest technologies.

(C) Specific attention will be given to strengthening growth linkages among the primary (farm), secondary (agro-industries, rural industries) and tertiary (services) sectors of the rural economy. The main aim of RSR will be to promote better growth linkages, particularly a purposeful and dynamic services sector

(d) Traditional technologies will be preserved, wherever they are the best from the ecological and economic standpoints. They will be enriched and their economic viability and social desirability enhanced, by integrating them with frontier technologies like bio-processing, micro-biological enrichment, computer sciences, space technology and micro-electronics.

(e) A new approach will be developed to component technology development by starting with the priority problems confronting small farmers and working toward scientific problems and approaches. Such a reorientation will lead to an optimum research methodologies mix, since it will involve a combination of adaptive, action, maintenance, anticipatory and strategic research programmes _ all designed to find solutions to the specific constraints met with.

(f) Social scientists will be involved at all phases of the RSR programme, so that they are able to play a proactive rather than a reactive role.

...9/-

(g) Three linkages will receive particular attention. They are:

i) impact on sustainability/micro-environmental indicators so that equity/poverty criteria are highlighted in trade offs.

ii) Backward linkages to basic /component technology research, a-nd

iii) Forward linkages to post-harvest processing, hiomass utilisation, markets and skilled jobs.

Organisation of a rural systems research programme on the lines indicated above, can be the best tribute we can pay to late Prime Minister Indira Gandhi.

Agricultural Research & Education VIII Plan Period

Priorities during the ~~Nineties~~

I Completing the tasks initiated during the VII Plan period

(a) New Institutes

(b) New central University for N-E Region

(c) . - .

II Consolidating the infrastructure of existing Institute / SAU's for improving their capacity for scientific excellence and relevance.

III New initiatives

1. New National Research centres
2. New Project Directorates eg. Wheat
3. Frontier Technologies

Technology Blending Centres

Information Technologies past control

4. New targets on a Mission Mode

4. Remedying imbalances

a) Commodity
- Crops : Pulses, Oilseeds
- Animals :

b) Factors of Production
- Biofertilizer
- Vaccines

c) Regional imbalances

5. Equity

(a) Intra-generational equity
- (a) Economically & Socially handicapped
  - S.C. ST, Landless labour
- (b) Genders : Women

(b) Inter-generational equity
- Conservation of Natural Resources
- Sustainable Agriculture

6. Education and Extension ~~Training~~ Education

KVKs

Lab to Land

Operational Research, etc

Research on delivery systems

7. Leadership in Partnership

(a) Within the country

i) Inter-disciplinary collaboration

ii) Inter-institutional collaboration

iii) Inter-organisational collaboration

iv) Public - Private Sector

(b) International collaboration

i) Bilateral

ii) Multilateral

iii) ECDC, TCDC

iv) Private ~~Sector~~ Sector

8. Futurology

1. Global climate change – temperature, sea levels, etc. – anticipatory research

2. New developments in processing technology
   eg. open ended spinning in cotton

3. Health Foods of the Future
   Horticulture – vegetables, fruits
   Eggs, Milk
   Fish

4. New developments in agricultural trade and pricing

Rural Systems Research Programme

Features

Backward linkages to traditional and frontier technologies

Slide — Forward linkages to processing and marketing

Lateral linkages among crops, trees and animals & fishes

Research on delivery systems and organizational structures.

Slide — Integrated Growth of Primary, Secondary and Tertiary Sectors

Rome 27 June

Presentation of 2013 HLPE Reports

Roma Tre University
Department of Economics
Pof. Pasquale De Muro

Roman Philosopher Seneca

"A hungry person listens neither to religion nor reason, nor is beat by any prayer. (where hunger rules, peace cannot prevail).

Roman Farmer Varro

Agriculture is a profession which can yield food in perpetuity, provided the soil is tilled and nourished properly, and water is harvested and used wisely"

Two reports (a) Investing in Small holder Agriculture for Food Security
(b) Biofuels and Food Security

IV 2013 Reports

Details will be presented by Ms Maryam Rahmanian and the Team Leaders.

- Inverity in smallholder agriculture for Food Security

Dr Pierre-Marie Bosc.

- Biofuels and Food Security

Dr John Wilkinson

Steering Committee oversight

Smallholders agriculture:

Dr Alain de Janvry

Biofuels

Prof Igor Tikhonovich

coordinators Vincent Gitz

& electronic

Draft Reports were offered

consultations and peer reviews

They were forwarded at a meeting

of the Steering Committee held at

Beijing during 13-15 May, 2013,

hosted by CAAS.

(B) Demand driven Reports

A. October 2011
(a) Price Volatility and Food Security (2008 price spike)
(b) Land Tenure and International Investments in Agriculture (eg. Land Grab)

B. October 2012
(c) Food security and climate change. (climate smart agriculture)
(d) Social Protection for Food Security (Right to Food)

C. October 2013
(e) Investing in Small Holder Agriculture for Food Security
(f) Biofuels and Food Security

D. October 2014
(g) Role of Sustainable Fisheries for Food Security & Nutrition at Aquaculture
(h) Food losses & waste in the context of sustainable food systems

97% of global water is sea water

III Diversity

In all these areas, there are no simple or uniform prescriptions, because of the diversity of socio-political, socio-economic and agro-ecological conditions prevailing in our planet. CPS is wise to take into account such variability in its global strategic framework for food security and nutrition.

IV Donors

I wish to record our gratitude to the Governments of Australia, the European Union, France, Ireland, the United Kingdom, Russia, Spain and Switzerland for their generous financial support, which made the undertaking of these studies possible

Steering Committee Reconstituted

Committee - Continuity & change

2 April 11:01 am

Date

Atomic Energy

(A) Translational Research

- Nuclear science applications

Nuclear Power

Waste Disposal

- Food Technology — Food irradiation
- Drinking Water — Maharashtra Dr. Wagle

Desalination of Sea water.

(B) Communication on Public Understanding of Nuclear Technology

Public outreach programme

Uranium Mines — Nalgonda —

Jaduguda.

DAE

Date

Energy Security

Natural Security

Food Security

Water Security – Quality + quantity of waters

Health Security – Cancer Research.

Leakages
Natural Hazards
Risks
Radiation Hazard
Food Products

Age Failure Nuclear waste
Kudankulam
Jaitapur
Uranium Mines

Public Understanding
Environment clearance
Transportation
– water security
change
at Shirley

Environmental clearance

Environment Advisor (EA)
Financial Advisor (FA)

Food products

Community Nuclear Safety Surveys

Community Nuclear Safety Surveys

Committee on Public Understanding of Nuclear Technologies

Radioactive Waste Disposal

Transfer of Technology Vast

Desalination + Purification

Drinking Water

Ministry of Earth Sciences

Monsoon Mission

Date

1) Generic information with location specific information.

2) INCOIS, Hyderabad – Fisher Friend
   Wave height
   Fish shoal location
   Warning on trespassing with Sri Lanka Water

Dr S S C Shenoy, INCOIS
Dr Shailesh Nayak, Secretary

Dr C S Rakhe, DG, IND,
Ho & TD & Successful products
Monsoon Mission

3) Centre in Svalbard – Polar Bear.
   North Pole → Snow Melt
   India is a Member of the Svalbard treaty

Implications of

(4) Sea level Rise : Indian Ocean is very fragile than global sea

Negative Impacts

Climate Refugees — resettlement

Awareness

Analysis — Environmental Engineering Design, Developmental ecologists

Action — Pollution control Boards.
Strengthening Monitoring Capacity
Energy Policy.

The build up of CO_2 and other gases in the atmosphere threatens far-reaching climate changes. One class of these gases — the Chlorofluorocarbons — are depleting the earth's ozone layer
Air pollutants from urban industrial areas are invading the countryside, seriously damaging aquatic life, forests and crops

In developing countries, deserts expand while forests retreat. The 1990s will be the crucial decade for action.

Brundtland: Poverty is a major cause and effect of global environmental problems.

Sustainable Development helps to meet today's needs with compromising the ability of future generations to meet theirs.
Action to move from net deforestation to net afforestation.

Gauging the effects of each pollutant is not simple because air pollutants mix together and interact. Between 1900 and 1985, the world's annual sulfur dioxide emissions increased six fold, while nitrogen oxide emissions increased ten times over. These gases together with the hydrocarbons that also result from fossil fuel combustion are the principal sources of both urban air pollution and the acid rain and oxidants. There has been an observed increase of globally averaged temperature of 0.7°C in the past century which is consistent with theoretical greenhouse gas predictions. If the current trend continues, mean surface temperature of the earth may rise by 1.5 to 4.5°C before the middle of the next century

Urban – Pollution from transportation.

Increase the efficiency of fossil fuel use.

Rural –

Pollution free

Long term energy policy

Develop non-fossil energy technologies – this means

Environmentally ~~safe~~ desirable

Energy Mix

electric and hydrogen powered vehicles as well as renewable energy technologies – solar photovoltaic cells, hydro power, wind turbines, solar hot water heaters and geothermal energy.

Nuclear power does not generate greenhouse ~~gases~~ gas emissions. There is however need for work on safe waste management and inherently safer reactor designs (without plutonium recycle).

1) — Apart from the traditional role of universities as centres of higher learning and promotion of knowledge through fundamental research and preparing manpower for middle & higher level jobs in Society, there is a third dimension as significant as the other two - Viz. extending & updating the knowledge so acquired to the community around through a series of Community-Oriented educational programmes - collectively called extension or Continuing Education. Dr. Sivaprasad was an ardent advocate of University serving the role of the hub of the creative activity in the society it was supposed to serve. & was particularly significant during 1975-76 when our P.M. was lamenting over the poor contribution of intellectuals and educated section of Indian Society to national development. The setting up of the Centre for Continuing Education was the response of NEHU to such a need.

2) In the context of the North-East the development of local entrepreneurship was particularly significant. Hence, a variety of educational & training programmes were arranged - like Courses in Tourism, Industrial Entrepreneurship, Journalism, Banking, Travel-Trade & Hospitality Management, Library Science, Fruit Preservation & Public Relations etc. Courses were designed even for tea-Kongs serving in small tea-establishment in different places.

(3) A well-developed Life-Science Deptt was established particularly geared to interact with other agencies working in the field- Promoting Fresh water fisheries, Social Forestry etc, Propagation of anti-ghumming concepts and promotion of Vegetable crops. Corporation with Himalaya Seva Sangh & organisation of the seminar on Social Forestry & the Himalayas.

4 Economics & History Departments courses were also designed to suit the needs of the region. A survey of the educational needs of the Community in & around Shillong was conducted in corporation with the Council for Social Dev., New Delhi - in 1977. & courses designed & modified in the light of the findings & observation

= One Seminar on "Economic Dev. of the NE Area in 1977 during the Gauhati Session of the Congress. in which economist & social scientists & leaders from all over the Country

The external costs of production such as sedimentation ground + surface water pollution etc. are not borne by the farmer. The costs of on-farm resource degradation are poorly understood.

Current research on the economics of sustainable agricultural systems appear to be mostly limited to US.

"Polluter Pays" principle to all

Traditional applications of linear programming by agricultural economists should ~~not~~ include environmental costs of production + depreciation of natural resource stocks.

Patterns of earth is not in exchange rate

1800 — 1 billion
1988 — 5 billion
Doubling in 40 years