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THE NATIONAL RESEARCH CENTRE'S INTEGRATED APPROACH IN COMBATING POVERTY

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Abstract

Globally, over 1.1 billion people, 30 percent of the mankind, live in absolute poverty with an income of only a dollar a day or less per person to meet food, shelter, and other needs. Not surprisingly, hunger, malnutrition, and associated diseases are widespread: more than 700 million people do not have access to sufficient food to lead healthy, productive lives; millions more live on the edge of hunger; and more than 180 million preschool children are significantly underweight. Every second person in South Asia and Sub-Saharan Africa is absolutely poor.

Poverty is mainly a rural phenomenon in most of the developing world, especially the low-income developing countries. The rural poor make up more than 75 percent of the poor in many Sub-Saharan African and Asian countries. Latin America's high urbanization rates have led to a higher prevalence of urban poverty, but even in that region the majority of the poor are rural. Hundreds of millions of urban children around the world live in deep poverty, their needs unmet, their rights contravened and their prospects damaged by conditions that threaten their health and undermine their development.

It must be emphasized that the world's distribution of wealth between the North and the South is quite uneven. According to the World Bank "the wealthiest 20% of the world's population garners 73% of the world's income, while the poorest 20% struggles to live with less than 1% of the world's income". This translates into high illiteracy rates, poor nutrition and health, etc. Unfortunately, this already huge gap between the poorest and the richest is widening.

It has been internationally agreed upon, that policies, research, and specially designed programs cannot be omitted when addressing community problems and in particular those of high seriousness.

The National Research (NRC) is a large facility in Egypt devoted to basic and applied research. It was founded in 1956 to conduct research contributing to national welfare, particularly in the fields of agriculture, industry, and health. It has its own campus on 12 acres, complete with laboratories, administrative offices, pilot plants, and support facilities.

The NRC is administered by a President, and two Vice Presidents, who report to the government through the Minister of State for Scientific Research. The NRC President is appointed by the President of Egypt and enjoys a status equal to a Minister and equivalent to that of the president of an Egyptian university. General policy guidance for the NRC is provided by a Board of Directors. Its research staff comprises approximately 2,500. Nearly 50% hold Doctorate Degrees and the rest hold at least Bachelor's and Master's degrees. Many of the senior generation, now full professors, received their graduate degrees and training from universities in Europe or North America. The research staff members are assisted by approximately 800 technical workers and 1800 administrative employees. The structure of promotion within the NRC as well as the salary scales parallels the Egyptian university system.

The NRC receives the bulk of its funding through an annual budget allocation by the government. It covers basic salaries of the staff, operating and maintenance expenditures, and a modest capital improvement. A second source of income is derived from research grants and contracts, primarily from the Egyptian Academy of Scientific Research and Technology (ASRT), public sector and other domestic organizations, but increasingly from private sector through contractual research for commercial clients. The third source of income is in the form of research grants from international donor organizations through competitive opportunities. While most of the budget from the government is committed to ongoing fixed costs, the revenue from external grants and contracts is used to support the initiation of new projects. Until recently, each department planned its research agenda autonomously, although this situation is gradually changing to a more centralized project planning system.

As the NRC seeks to strengthen its capabilities and to mobilize its resources to address problems of national development, research planning has become a more centralized management function. The administrative structure now includes a research and development (R&D) management unit which is responsible for establishing research priorities in consultations with the NRC staff and for reviewing and approving decisions on all projects to be contracted with government agencies, companies, and other customers that will be performed in NRC departments. It is also responsible for coordinating the dissemination of technical information and preparation of scientific publications of the NRC. The offices report directly to the President and the Vice Presidents of the NRC.

I- INTRODUCTION

There are currently 1.2 billion people, 30 percent of the mankind, live in absolute poverty with an income of less than one dollar per day, and almost 3 billion living on less than two dollars per day per person to meet food, shelter, and other needs. Not surprisingly, hunger, malnutrition, and associated diseases are widespread. More than 700 million people do not have access to sufficient food to lead healthy, productive lives; millions more live on the edge of hunger; and more than 180 million preschool children are significantly underweight. Every second person in South Asia and Sub-Saharan Africa is absolutely poor. Globally, the proportion of people living in poverty declined from 29% on 1987, to 26% in 1998, although the total number of poor remained almost unchanged at around 1.2 billion.

Poverty is mainly a rural phenomenon in most of the developing world, especially the low-income developing countries. The rural poor make up more than 75 percent of the poor in many Sub-Saharan African and Asian countries. Latin America's high urbanization rates have led to a higher prevalence of urban poverty, but even in that region the majority of the poor are rural. Hundreds of millions of urban children around the world live in deep poverty, their needs unmet, their rights contravened and their prospects damaged by conditions that threaten their health and undermine their development.

It must be emphasized that the world's distribution of wealth between the North and the South is quite uneven. According to the World Bank 'the wealthiest 20% of the world's population garners 73% of the world's

income, while the poorest 20% struggles to live with less than 1% of the world's income'. This translates into high illiteracy rates, poor nutrition and health, etc. Unfortunately, this already huge gap between the poorest and the richest is widening.

It has been internationally agreed upon, that the following components cannot be omitted when addressing community problems and in particular those of high seriousness.

Policies

It is generally agreed that orthodox structural adjustment programs have had negative repercussions on the poor during the short and medium term in many developing countries. Social funds have been created in a number of affected countries to mitigate this impact. Little theoretical or empirical work, however, has been attempted to determine how structural adjustment policies per se could be modified so as to achieve their economic objectives at a reduced social cost. Adjustment policies should be more nuanced and pragmatic, and that the proper sequencing and phasing of adjustment instruments is all-important. Reliance on market mechanisms should be tempered by an adequate governmental presence to compensate for market failure and alleviate poverty during the adjustment process.

Policies should be directed to investigate the specific problems faced by poor and marginalized children growing up in the world's urban centers, analyze the underlying causes of these problems with a particular focus on the quality of governance and, importantly, discuss the action that is needed at the neighborhood, city, national and international levels.

Research

Research is essential to examine how macroeconomic policies affect poverty. In India, data from comparable household consumption surveys spanning 40 years are being used to evaluate the effects of various macroeconomic and sectoral variables on the poor. In China, a new panel dataset is being constructed for four rural provinces from comparable household surveys from 1985 to 1990. Work is also being completed on a project that analyzes how household welfare is being affected by the transition to a market economy in Viet Nam.

Other projects focus on the labor market as a mechanism for reducing poverty. A research project on the impact of economy-wide policies, such as trade liberalization, and of labor market regulations, such as the minimum wage, on the demand for labor will be extended. In addition, work is continuing on public sector retrenchment and efficient compensation schemes.

Major issues to be examined include how government policies affect pollution and employment outcomes in industrial firms, how providing infrastructure can affect farm productivity, and whether there is a link between the degradation of the environment and individuals' fertility decisions.

Programs

Examples of some of the programs which had positive outcomes internationally are the "*South Asia Poverty Alleviation Programme*" (SAPAP), which was developed as the UNDP response to the 1993 Dhaka SAARC Summit Declaration on poverty alleviation. It supports the three pronged approach advocated by the Independent South Asian Commission on Poverty Alleviation (ISACPA), focusing its field operations on social mobilization, and linking this with advocacy for a supportive macro policy environment as well as a rigorous and participatory poverty monitoring system. SAPAP shares ISACPA's basic premise that *the poor are major potential contributors to growth.* Experience in South Asia and elsewhere has demonstrated that the poor can join the mainstream of economic activity, given a favorable policy environment that facilitates their organization in order to access their rights and participate effectively in governance structures, especially at the local level.

Another example is the "Urban Self Employment Programme" (USEP) in India, whose salient features are that the program rests on a foundation of *community empowerment.* It relies on establishing and promoting community organizations and structures to provide supporting and facilitating mechanism for local development. Towards this end, community organizations like Neighborhood Groups (NHGs), Neighborhood

Committees (NHCs), and Community Development Societies (CDSs) are to be set up in the target areas based on the UBSP pattern. The CDSs shall be the focal point for purposes of identification of beneficiaries, preparation of application monitoring of recovery, and generally providing whatever other support is necessary to the programme. The CDSs will also identify viable projects suitable for that particular area.

II- THE SITUATION IN EGYPT

It is undeniable that poverty exists in a great sector in rural and urban Egypt, especially in remote areas and communities. These communities are characterized by the uneven distribution of wealth and benefits from any processes even if the poor are part of these processes. This could be a reflection of several factors the most important of which are the unemployment and illiteracy. Unemployment, according to the CAPMAS reports 1995 accounts to 7.2% in males and 23.6% in females. The unpaid and inofficial employment of women (39% in year 1998) in many of the sectors, the agricultural in particular contributes to the problem, as there are no social nor medical insurances. The second factor is the relatively high percentage of illiteracy that has been reported the UNDP 'Report for Human Development 2000', to be 41.8% among females above the age of 15 years.

Poor families fail to educate their children due to mere economic conditions as has obviously been reported in almost all governorates, especially those in the South of Egypt. It is predicted that the number of people living in very bad conditions would be increasing if failure to catch up with the other communities. And the real danger lies in getting stuck in the *vicious circle of poverty, illiteracy, unemployment of adult, child labour and poverty.*

All these problems are being attacked by the Egyptian government, but all actions taken are fragmented and segregated. Some efforts, governmental and non-governmental, have been spent towards combating poverty. Examples are the small grants donated by the Ministries of Social Affairs, Man Power, Awkaf, Local Development, Social Fund for Development as well as NGO's and private establishments. The government's policy not only concentrates on the small grants but also tries to build up systems for sustainable reduction of poverty in urban and rural communities. Thousands of grants have been allocated focusing on women to start own businesses 'Self-Employment' on small and micro levels.

Community Tailored Programs for implementation are the effective outcome of policies and strategic planning as well as the proper use of research results. The interaction between the different organizations is indispensable.

Therefore, unless concerted multidimensional actions are taken now, poverty is not expected to diminish much in the near future. A comprehensive solution is focusing on integrated programs which would represent the only starting point for any comprehensive solution and attack against poverty.

III- NRC'S APPROACH TOWARDS POVERTY REDUCTION

NRC is a host for a variety of technologies for medium, small, micro-enterprises, and feeding industries. It's role can extend to assisting in developing recommendations for policies and practical considerations ranging from exchange rate and trade liberalization policies to quality-control, packaging and just-in-time delivery considerations. Its staff can provide an overview of various distribution channels through which the products of the small-scale sector may be modified for export purposes.

Being part of the policy making structure and a major contributor in the implementation of the programs, NRC's substantial base of researchers would also collaborate with other national and international organizations in designing research conducted targeting poverty to cover other important aspects such as the dynamics and needs of the individual communities. The social, economic and cultural aspects of communities are as important for strategic planning as health research. Appropriate solutions for each community should be the research result. These results are then tested and evaluated in order to reach appropriately modified programs for implementation. In Egypt, specialized organizations for such research are the centers for social,

economic, political and cultural studies affiliated to the universities, the Center for Social and Criminal Research, in addition to concerned ministries.

NRC can provide an integrated approach in addressing the issue of poverty reduction. The integration is a direct effect of the multidisciplinary structure of NRC where researchers and their assistants are located in the same campus and collaborate together to solve specific problems that are of impact to the national economy. A unique feature of NRC is the integration of health in its structure, where many studies and researches were conducted on hunger, malnutrition, and associated diseases. These ailments are widespread because of poverty and are also blamed to be a direct cause of poverty as well.

In short, NRC not only seeks multidisciplinity as an intra-center activity, but also is concerned about being integrated with other national organizations such as universities, ministries and industry. Through cooperation with political authorities, NRC can serve as a vehicle for reaching a broad consensus on the policies required to alleviate poverty, as well as for the formulation of guidelines to translate these policies into programs and mobilize domestic and external resources in support of poverty alleviation efforts.

As a guideline, the World Development Report (WDR) 2000/2001: "Attacking Poverty", which presents a multidimensional view of poverty, is taken into consideration. It underscores the importance of increasing poor people's access to opportunity, security, and empowerment for economic growth and poverty reduction. Building on WDR 2000/2001, the World Bank's Strategic Framework Paper identifies two priority areas for support to client governments to increase development effectiveness: a) building the climate for investment, jobs, and growth, and b) empowering poor people and investing in their assets. In that context, it is important to note how empowerment enhances development effectiveness. Support for broadening people's access to basic education and health care is central to the empowerment agenda; it is also critical for optimizing the long run effectiveness of development strategies, including the creation of a dynamic investment climate. Finally, it should also be emphasized that empowerment, in the sense of enlarging people's choices and hence their freedom to take action to shape their lives, is much more than a means to other objectives; it is a good in itself, and a desirable goal of development.

Considering the two priority areas mentioned in the WDR 2000/2001 on one hand and the mission, objectives, function and capacities at the NRC, we realize that it could act as a major contributor with a substantial role in reducing poverty at the national as well as the regional level. The manpower at the National Research Centre show great potential adopt multidimensional projects to combat poverty. They possess the capabilities and are trained to study, design and implement large scale multidisciplinary projects and programs. In that regard, their main focus will be on the following areas, taking into consideration that *NRC's suggested approach for poverty reduction has an environmental focus concentrating on pollution prevention and resources conservation*:

A. Job Creation and Increasing Employment Opportunities;
B. Community Empowerment by Information
C. Provision of Health Services

A. Job Creation and Increasing Employment Opportunities by Providing Technologies for Medium, Small and Micro-Enterprises

NRC is a host for a variety of technologies for medium, small and micro-enterprises and is considering their potential in creating jobs for the poor. It can assist in developing recommendations for policies and practical considerations ranging from exchange rate and trade liberalization policies to quality-control, packaging and just-in-time delivery considerations.

NRC staff can provide an overview of various distribution channels through which the products of the small-scale sector may be exported and methods for accessing markets of developed countries could be improved in the cases of labor-intensive exports from developing countries.

The available technologies can be divided into the following two categories: (i) Simple technologies with affordable initial investment for impoverished communities; and (ii) technologies that require an initial investment and serve multiple users from the impoverished areas.

A. 1. Simple Technologies with Affordable Initial Investment

A. 1.a. Reduction of Food Industries Losses and Optimizing Waste Utilization

The sector of food industries includes several industries such as the fish and meat, bakery and cereal, vegetables and fruits, dairy, edible oils and shortening industries. Losses in the food industry constitute a major problem regarding the net income out of this industry and the pollution load due to the solid and liquid wastes. These losses can be reduced by simple in plant modifications such as recycling of some process streams, readjustment of the process conditions, and simple modification of the technologies used.

In a study made in the National Research Center, the processes used in the oil and soap industrial sector have been surveyed and analyzed to identify the technological modifications necessary to reduce losses. This means minimization of wastes, which will be reflected positively on the environment. According to this study, some simple technological modifications were suggested and evaluated. They proved to have promising economic rewards.

In addition, the wastes of the food industry can be utilized in feeding lactating animals such as buffaloes and goats. The results of a research study conducted, the NRC (1998-2001) showed that the wastes of the processing of potatoes, tomatoes, onions and dates can successfully replace about 60% of the rations of lactating animals. This saves about 60% of the cost of animal feeding in addition to the reduction of the pollution load due to the solid wastes. It has also been reported that by supplementing the diet with baker yeast or fenugreek seeds would lead to improved productivity of dairy animals.

A.1.b. Edible Mushrooms from Farming Wastes

The use of mushrooms as human food dates back to antiquity. Today with the development of better technologies and greater realization of their nutrient values, mushrooms occupy an important place in food habits of people in several parts of the world. It is unfortunate that in Egypt mushrooms have not caught the imagination of the public at large to become an important food item. This is particularly paradoxical since it could become an important source of nutritive proteins, vitamins, and minerals to the vast number of vegetarians. One of the reasons for not being accepted is their non-availability at low prices for the common man and also due to lack of knowledge of their cultivation methods. Hence, it is necessary that a large number of people are made aware of the simple methods required for successful cultivation of edible mushrooms.

Increase in population is creating an alarming situation in the food problem throughout the world. Malnutrition in terms of "protein" deficiency is becoming a major hazard in developing countries. Exploiting non-traditional food resources can make a substantial breakthrough to meet the serious food deficit. One economically feasible and practically exploitable approach would be the microbiological conversion of agricultural biomass into microbial biomass protein "mushrooms" "bioprotein" and concurrently, alleviate some of the global malnutrition, hunger problems, and reduce pollution. Mushroom can be grown anywhere if the essential conditions are obtained or controlled. These conditions are: temperature, moisture, ventilation, and good spawn. The cultivation of mushroom requires a series of simple steps that should be adopted:

- Compost and methods of composting;
- Spawn and methods of spawning;
- Casing;
- Harvesting.

The compost is made from farming waste and some chemicals.
Mushroom farming is becoming successful because of its very low inputs. In Egypt, mushroom growing can be highly rewarding because farming wastes are abundantly available. Moreover, it is possible to grow several heavy crops of mushroom in a year and its intensive cultivation and high yield can compensate for the protein content. The data on economics provide an impetus to any farmer or semiskilled worker to start growing edible mushrooms as an enterprising profession or even a useful hobby. With increasing scientific research in the biology of mushrooms and more improvised techniques for growing them, mushroom cultivation has almost become an industry in several countries. It is estimated that about 300 million tons of fresh mushroom

can be produced from just one-fourth of world's annual yield of straw. Such an amount would provide 4,100 million people with 250 g of fresh mushroom daily.

Mushrooms appeal to different people in different ways. They are objects of beauty for artists, and for medical people they are the possible source of combating nutritional diseases as well as new drugs discovery. Mushrooms provide a rich addition to the diet in the form of proteins with essential amino acids, carbohydrates, valuable salts and vitamins. The nutritional value of mushrooms lies between meat and vegetables. The supplementary value of mushroom protein in vegetarian diet is, therefore, of considerable significance. Mushrooms provide a high protein and law caloric diet. In other words they are the number one diet to be recommended to heart patients. Its beneficial effects are reported to be enhanced, vigour and energy, enhanced sexuality and diminished aging. Modern medical claims include eritadenine, which lowers plasma cholesterol levels; lentinan, which shows anti-tumour activity and was inhibitory to the development of AIDS; rentinan, which strengthens the cell immunity towards cancer; and antiviral properties from extracts of fresh spores, which is purported to induce interferon formation.

A.1.c. Compost from Organic Wastes

For many centuries, composting organic wastes was practiced by farmers. Composting is a biological process in which organic biodegradable wastes are stabilized and converted by the action of mixed microbial population "bacteria, actinomycetes, and fungi" under controlled conditions "aeration, moisture, temperature, etc." into a hygienic humus-rich product "compost" to be used as a soil conditioner and organic fertilizer, i.e. composting is the decomposition of organic matter by a mixed population of microorganisms in a warm, moist and aerobic environment. Considerable amounts of organic material, produced annually in nature, are eventually degraded by microbial action. This normally takes place slowly on the surface of the ground, at ambient temperature and mainly under aerobic conditions. The natural process of breakdown can be accelerated by gathering the material into heaps to conserve part of the heat of fermentation. This heat leads to an increase in the temperature of the mass and faster reaction rates are obtained. This accelerated process is composting.

The inherent advantage of composting is the wide range of wastes that can be used which include: Farming wastes (rice straw, rice hulls, wheat straw, barely straw, corn stalks, corn cobs, cotton stalks, banana stems, palm leaves, palm seeds, etc.). Agro/industrial wastes (sugar-cane bagasse, fruit peels, vegetable trimmings, husks, brans, etc.). Almost any organic waste material can be made into compost, i.e., wastes amenable to composting vary from the highly heterogeneous organic/inorganic mixture in urban refuse to the reasonably homogeneous crop residues, farm manures, and sewage sludges. An important consideration in increasing agricultural output is raising the level of soil fertility. A method of improving both soil structure and the supply of plant nutrients is the application of humus "the end product of composting" to the soil.
Lignocellulosic biomass is the most abundant and renewable natural resource throughout the world. The amount of these wastes can be locally very high and may contribute to a significant level of pollution. Thus, the utilization of such wastes biologically serves in: reduction of pollution and production of economical and useful products. The composting of organic wastes is a dynamic and complicated ecological process in which temperature, pH, and food availability are constantly changing. In consequence, the numbers and species of organisms present also change markedly. The rate of progress towards the mature end product, humus, is dependent on several interrelated process factors. These include C/N ratio, nutrient supply and structural strength of the material, particle size, moisture, temperature, aeration, agitation, pH, heap size, and duration time. It is desirable to adopt the best operating conditions allowed by the economics of the operation.

Compost is a brown and peaty material, the main constituent of which is humus. It has the following physical effects when applied to the soil: lightens heavy soil, improves the texture of light sandy soil, increases water retention, enlarges root systems of plants, and makes additional plant nutrients more available as it contains N, P, and K and when used in conjunction with artificial fertilizers, it makes the phosphorus more readily available and prolongs the period over which the nitrogen is available, thus improving nutrient take-up by plants. All trace elements (micro-nutrients) required by plants are available in compost.

Why Composting?

- The reduction of environmental pollution
- Reduces the bulk volume of the organic wastes
- Air and water pollution is minimized
- Fly and rodent populations can be controlled
- Production of hygienically safe material which meets public health standards
- Production of marketable product in the form of useful humus material by which carbon and nutrient elements are returned in usable form to the ecological cycle
- The need for clean farming system
- The need for soil conditioners
- The great water loss in sandy soil
- The reclamation of new land whether sandy or calcareous needs more organic matter
- The increased cost and shortage of chemical fertilizers
- Lower capital costs

Hence, the recycling of farming wastes to compost can be considered as a suitable implementation of technology for poverty alleviation, which helping farmers and semiskilled workers in poor communities to realize greater profits out of local material inputs with reduced requirements of expensive chemical fertilizers and with evident benefits for the environment.

A.1.d. Silage From Agricultural Wastes

Old oil paintings found in Egypt dating from the period 1000 to 1500 BC demonstrate that Ancient Egyptians were familiar with ensiling the whole-crop cereals. Ensilage has become an increasingly important method of conservation in the past 50 years. The greater popularity of silage stems are largely from: (a) the escalating cost of feed concentrates throughout the world, and (b) the development of a technology that enables material of a more predictable quality to be made than was possible previously. Such quality is affected greatly by the type of fermentation occurring during preservation. In general, any material that is unstable in air and has, or is provided with, sufficient fermentable carbohydrate can be ensiled. In Egypt, renewed efforts were made to establish the means for making consistently good quality silages, particularly from low quality roughages such as agricultural and agro/industrial wastes. These efforts were prompted by the desire on the production of unconventional fodders for livestock to attain self-sufficiency, presumably because the conventional silages made from corn, grasses, legumes, etc. were considered insufficient. Farming wastes represent an important untapped resource of about 20 million tons produced annually in Egypt. Even though they contain enough cellulose and hemicellulose to make it a source of energy for the ruminants, they are inefficiently utilized by ruminants because of low nitrogen and high content and low digestibility of the fibrous fractions. This low digestibility is mainly related to the rigid cell wall structure, i.e. the extent of cell wall lignification. The straw that consists of the mature stems and leaves, without the seeds, has relatively little protein, starch, or fat, while the content of fiber and lignin is high. Straw is also low in calcium, phosphorus and in most vitamins, especially in vitamin A value. Probably it generally has considerable vitamin D. Because of its high content of fiber and especially of lignin, straw supplies considerably less total digestible nutrients than good hay, and there is a far greater difference in the amount of net energy. Straw from the small grains furnishes less than 1 per cent of digestible protein. Therefore this lack of protein must be borne in mind in feeding straw.

The wide use of silage is the result of the following advantages:

- The use of silage generally makes it possible to keep more stock on a certain area of land.
- At a low expense silage furnishes high-quality succulent feed for any season of the year.
- Crops may be ensiled when the weather does not permit curing them into hay or dry fodder.
- Silage is eaten practically without waste.
- The ensiling process kills many kinds of weed seeds.
- The crop from a given area can be stored in less space as silage than as dry forage.

- When a crop is ensiled, the forage is removed from the land early, so that it may be prepared for another crop.
- In areas where there is considerable damage from borer, cutting the stalks close to the ground and then ensiling the crop is one of the best methods of controlling the pest.

Silage is the product formed when a raw material liable to spoilage by aerobic microorganisms is stored anaerobically. It is formed by a process called ensilage that happens in a structure called a silo. Normally during ensilage the fodder undergoes an acid fermentation in which bacteria produce lactic, acetic, and butyric acids from sugars present in the raw material. The net result is a reduction in pH, which prevents the growth of spoilage microorganisms, the majority of which are intolerant of acid conditions. Good silage has certain merits not possessed by most dry roughages. It is highly palatable, and therefore stock will usually eat more roughage on the dry basis, when fed silage in addition to hay, than when receiving only dry feed. This often makes possible a considerable saving in the amount of concentrates required for good production. It is possible that a nutrient additive will improve both nutritive value and fermentation quality. The method used for improving hay-crop silage is the addition of molasses as a preservative. This increases the sugar content so that enough acid is formed in the fermentations to preserve the silage properly. The addition of molasses decidedly improves the quality of silage. The carotene content of the silage also tends to higher when molasses is added. Most of the feeding value of the molasses, that is added remains in the silage, because the sugar in the molasses is converted chiefly into lactic and acetic acids, which have food value. It is estimated that about 75 per cent of the nutritive value of the molasses remains in the silage. Cane molasses, beet molasses, corn molasses, citrus molasses, or wood sugar molasses can all be used for this purpose. The second is a source of nitrogen or minerals normally added to raw materials, which are invariably high in energy but low in protein and minerals, i.e., grain crops. The effect of ensiling process augmented with some additives (molasses and/or urea) of some low quality roughages has been examined by Shawky et al., 1990, who found that the treatment of rice hulls + 2% cane molasses for two months ensiling period under anaerobic conditions can be considered as the optimum condition for the production of good quality silage from the low grade roughages rice hulls. Numerous experiments have proved that silage is more economical and efficient than dry corn fodder for dairy cattle, beef cattle, and sheep. The cost of ensiling the crop should be reduced as much as possible by using efficient methods. Consequently, alternative uses of these agricultural and agro/industrial wastes for more important unconventional fodders for livestock could have a major impact upon the economics of developing countries.

A.2. Technologies Which Require an Initial Investment and Serve Multiple Users

In Egypt and many developing countries, poor people work primarily in the informal sector, surviving through a patchwork or employed by small and medium enterprises (SMEs). The informal sector is responsible for 83 percent of new jobs in Latin America and the Caribbean and 93 percent of new jobs in Africa. In Egypt ILO reported that the informal sector employs 61% of males and 39% of females in year 1998. It is to be mentioned that this number showed a rise in the female as it was 33% during 1988.

One major role of NRC could be to assist the small and micro-scale entrepreneurs to face their own problems and assist them solving them. This activity will need a third party donor who would finance it as it will require initial investment that is not available by the poor nor the research institution. Some ideas are forming groups, associations, and agricultural and industrial and clusters. The following are only two suggested ideas to be adopted by NRC:

A.2.a. Utilizing Solar Cells for Water Pumping in Remote Areas

In Egypt, 96% of land is desert occupied by 4% of the total population while the 96% population are crowded around the river Nile and its branches. There is always need to expand the cultivated area for both social and economic energy represents one of the major challenges to develop these areas and improve the life status of the poor communities living there in nomadic style of life. The national electricity grid is very far, and the government is spending extensive budgets for extensions to those remote areas. In addition, there are no paved roads to transfer fuel, which may operate diesel generators.

The solar radiation is available all the year round in Egypt and the Arab region. Thus, the photovoltaic cells represent a possible and suitable solution to provide the energy needed for desert development.
In a demonstration project in Sinai, a deep well pump was connected to a photovoltaic panel producing about 1.5 kW. This system was capable to irrigate an arid area of four feddans. These projects are managed successfully by the owners of the land since 1986, as almost no technical background is required. Although the initial cost was relatively high, but this farm is able to produce cash crops like watermelon, tomato and cantaloupe providing a net profit of about 20-25,000 pounds each year.

A.2.b. Preservation of Fruits and Vegetables by Drying

A considerable portion of the fruit and vegetable crops are usually spoiled and wasted if not marketed in the proper time. The loss of these crops will reduce the food availability especially in poor populations. Examples of the fruit crops that spoil easily are grapes, peach, apricot, apple and banana. Tomato is an example of the fastest vegetable crops to spoil. Preservation of these crops, whole or sliced by drying changes this portion of the crop to a valuable product.

Food drying is a very simple ancient skill. It requires a safe place to spread the food where dry air in large quantities can pass over and beside thin pieces. Sun is often used to provide the hot dry air. Dry, clean air including dry cold air from any source will dehydrate food.

Although drying is a relatively simple method of food preservation, a trial and error approach often is needed to decide which drying techniques work best. For example, it is quite necessary when drying foods that the moisture is removed as quickly as possible at a temperature that does not seriously affect the flavor, texture and color of the food. If the temperature is too low in the beginning microorganisms may grow before the food is adequately dried. If the temperature is too high and the humidity **is** too low, the food may harden on the surface. This makes it more difficult for moisture to escape and the food does not dry properly.
Several methods can be used for drying such as oven drying (gas or electric), room drying and solar drying which is largely affected by the climate. The climate of the Arab countries is highly suitable for solar drying as it is sunny most of the year.

B. Community Empowerment by Information

B.1. General Considerations

The term empowerment has different meanings in different socio-cultural and political contexts, and does not translate easily into all languages. An exploration of local terms associated with empowerment around the world always leads to lively discussion. These terms include self-strength, control, self-power, self-reliance, own choice, life of dignity in accordance with one's values, capable of fighting for one's rights, independence, own decision making, being free, awakening, and capability—to mention only a few. These definitions are embedded in local value and belief systems.

Empowerment is of intrinsic value; it also has instrumental value. The term can be used to characterize relations within households or between poor people and other actors at the global level. There are important gender differences in the causes, forms, and consequences of empowerment or disempowerment. Hence, there are obviously many possible definitions of empowerment, including rights-based definitions.
"When the rich and poor compete for services, the rich will always get priority." Changing unequal relations depends in part on top-down measures to improve governance—changes in the laws, procedures, regulations, values, ethics, and incentives that guide the behavior of public officials and the private sector. It also depends crucially on the presence of well-informed and well-organized citizens and poor people. These changes can create the conditions that enable poor women and men to exercise their agency.

The social and cultural context is particularly important for empowerment approaches. Empowerment approaches will sometimes be controversial; for instance, local women's demands for autonomy and equal access to resources could seem to be against cultural norms.

In its broadest sense, empowerment is the expansion of freedom of choice and action. It means increasing one's authority and control over the resources and decisions that affect one's life. As people exercise real choice, they gain increased control over their lives. Poor people's choices are extremely limited, both by their lack of assets and by their powerlessness to negotiate better terms for themselves with a other parties, formal and informal. Since powerlessness is embedded in the nature of poor people's relations, appropriate empowerment is essential in the context of poverty reduction.

Empowerment is the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives.

Empowering poor people requires new relations and partnerships based on respect and tolerance among government, the legislature, civil society, poor peoples' organizations, research institutes, the private sector, and donors. Strong civil society and government institutions — at both the local and national levels — are essential for sustained poverty reduction. Special attention should be made to the intermediate civil society groups, who have critical roles to play in supporting poor people. They can translate and interpret information to them, and help link them to the government and the private sector.

Information is power. Informed citizens are better equipped to take advantage of opportunities, access services, exercise their rights and negotiate effectively. Information dissemination does not stop with the written word, but also includes group discussions, poetry, storytelling, debates, street theater, and other culturally appropriate forms and uses a variety of media including radio, television, and the Internet. Timely access to information in local languages from independent sources at the local level is particularly important. It is not uncommon that governments underestimate the need for information and under-invest in information disclosure and dissemination. Critical areas include information about rules and rights to basic government services, about state and private sector performance, and about financial services, markets, and prices. Information and communications technologies (ICT) therefore can play an important role in connecting poor people to these kinds of information, as well as to each other and to the larger society.

As information is power, hence it is critical for the developing countries and to the poor populations in particular. At present it is considered as a major tool for community development and consequently economic growth. Unfortunately, there exist in addition to the Digital Divide a Gender Gap in the design, use, and general access to technology. The technological gender gap is not only a consequence of technology being male dominated, but also another expression of the historical alienation from power/knowledge of women (the poorest of the poor). The technological gender gap refers to the disproportionate number of women who do not have access or, just have limited access, to the critical resource that is information in our age as well as access to other benefits associated with the information revolution compared to men.

During the last 10 years, governments, international and nonprofit organizations have embraced the development of Telecentres as an effort to ameliorate the digital divide between the North and the South under the sometimes too enthusiastic assumption that Telecentres will lead to development in the so-called developing countries. Although this assumption is still uncertain, we believe that Telecentres have a good potential and can promote the socio-economic development of the population. However, it appears that most of the existing models have not taken the community's needs, knowledge, talents, or interests (and those of marginalized groups within the community) sufficiently into consideration. Taking these seriously, would require a careful community needs assessment, community education and a community action.

B.2. Role of NRC in Empowering Communities by Information

NRC has an important role to play in enabling technological and medical support to local communities. In collaboration with concerned donors and the private sector, NRC can:

- create a network of learning about the empowerment of poor people by informing, educating and training them
- monitor, evaluate, and communicate information to poor citizens in the form of tailored information resources.

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Multi-Purpose Information and Communication Telecenters are one of the formats that NRC can utilize to provide information through its Computer Department, which is concerned with the automation of the data and information. The department will be the central node and administrator to the information and data related to the remote communities. Collaboration with the Ministry of Communication and Information Technology as well as the local societies for SME is envisioned. The MCIT is establishing technology centers allover Egypt, whose infrastructure can be used for the designed purpose.

B.2.a. Training

The MPICC will serve as a place for training on information and communication technologies to increase the opportunities of the young potentially promising sector of the population in finding decent jobs. This is primarily the MCIT's strategy.

In this context, it is worth mentioning that training is one of the NRC's strengths. The Training Center affiliated with the NRC organizes an annual program of training courses in various scientific and technological areas and at different levels. The program is mainly concerned with the transfer of specially tailored experience to those who work in sectors of industry, production and services in Egypt, the Arab World and the African Countries. The experience attained by those trainees is essential as a basis to keep up with the fast moving developments of science. Joint Training courses with Foreign and International Organizations are often organized in some areas. R&D Management Training Courses are offered as well to researchers and administrators in universities, ministries and public sectors.

It is thus within the capabilities of NRC to conduct specially tailored courses fit with the demand of the targeted impoverished communities. These courses can cover a wide range of specialties, from training on conventional to new technologies as well as education and awareness in the public health and management of small businesses.

B.2.b. Development of Community Tailored Information Resources

On the other hand, ICT will serve as the vehicle for the information resources developed for the communities in their own language. There exists a large check list for the information resources from which remote societies will benefit. The development of information resources will require need prioritization and assessment followed by design and testing. The most appropriate methodology for that is the *participatory approach*. This methodology entails that all concerned parties, the target population in particular, participate in the planning, design and evaluating the end product they are going to use, which is in this case the information resource.

As NRC will be using the new technologies to approach communities of different characteristics, this requires a modernized setup for communication and information to be available. NRC is undergoing a process of establishing a large scale updated communication and information infrastructure. Up-grading of the working staff is one major concern at present in order to be able to developing effective, well-targeted experience, information resources and transferring them to the communities, whether scientific or underprivileged. The modes of transfer of information or the communication format will depend on the target communities.

C. Health Services

Health and development are interlinked so that through health, suitable development can be reached. Health is regarded as an important cornerstone for economic growth.

"Children come first". Poverty reduction must begin with children, not only because they are hardest hit when poverty strikes, but because child poverty causes lifelong damage to their minds and bodies; so that they are likely to pass poverty on to their children, sowing the seeds of a perpetual cycle of poverty. The provision of an integrated package of basic social services of good quality to all children is therefore one of the most direct and least expensive ways of reducing poverty. Millions of children are denied their social and economic rights, even though the resources, knowledge and techniques are available to give each and every child a good

start in life. A massive and front-end investment in children is within the financial reach of all countries, even the poorest ones. It is not a question of charity, but of laying the foundation of a strong economy. The policy of targeting the poor does not work. The 1990s has seen a series of broken promises in the area of health because there has not been enough investment in health and there has not been a real attempt at eradicating poverty.
Health for the poor is not only about access to appropriate services and quality care, which is not usually available, but also to enable them to protect their livelihood to be respected and treated with dignity. This will give them the opportunity to make sound connections, to build their networks and access other services and resources. Thus health means self-confidence [WHO Report, June 2000].

Chronic illness and poverty is another vicious circle that needs to be broken. Some diseases like hepatitis C and Shistosomiasis represent a real health crisis not only in Egypt but also in other developing countries as they may result in shortening life by one-third, loss of jobs and general increase in poverty rates. The achievements over the past 4-5 decades constitute a real strength in that aspect.

Health is a major issue where NRC can have a major contribution. It bears a wide range of activities that are diverse with the end result of providing the means to build health systems at the local level to allow greater accessibility and responsiveness to the poor people. Several researches at NRC reported that the income of poor populations can be enhanced by optimum utilization of natural resources, agricultural and industrial wastes, by applying suitable strategies for building their capacities and by improving their health status. The health status can be improved by applying national nutritional strategies suitable for each vulnerable group (infants, children, teenagers, old people, etc...), by proper protection and treatment of serious and chronic diseases and also by reducing environmental pollution and its adverse impact on health.

NRC can play an important role by contributing effectively in three different approaches specially tailored for the poor, children in particular, to produce and protect their good health.

1. Medical interventions including primary health care, medical examinations, tests, and treatments, vaccines and drugs.
2. non-medical health interventions, such as training of medical personnel, building of better health information systems, and strengthening of systems for procuring, storing, and developing pharmaceuticals and other medical equipment;
3. non-health interventions to provide health benefits

C. 1. Medical Interventions

C.1.a. Prevention of Nutritional and Communicable Diseases in Children

Several departments, housed at the NRC contribute to this activity. Among these are the Child Health, Community Medicine and Nutrition Departments. Their staff was involved in a number of programs to assess the nutritional status of infants and children as well as their mothers. Implementation programs to improve the nutritional status were also conducted in several villages to test some developed regimes, whether using functional foods or supplementation in the form of medication. The main focus was to provide the poor sector of the population with their requirements from different nutrients in a convenient and available form. Some of these efforts are enlisted as follows:

Nutrition Cake for School Lunch Program

Field survey based upon anthropomteric measurement and food consumption pattern revealed that considerable number of children particularly in rural areas suffer from growth retardation and anemia. Among the causes behind the health problem is malnutrition. The children do not obtain satisfactory amounts of nutrients that satisfy the requirements.
Research members in the nutrition department could design a formula made from local food ingredients that are cheap and familiar. This was offered to primary school children in the form of "cake" that contains more than 40% of their daily requirements of different nutrients including proteins, carbohydrates and minerals. This cake was adopted by the Ministry of Education to replace the usual school lunch program. Follow-up studies indicated that this program realized improvement in the nutritional state of the children.

Combating Anemia among the Population

Anemia due to iron deficiency spread among different sectors of the population particularly children, pregnant and lactating women. Field surveys show that more than 30% of the primary school children suffer from iron deficiency anemia.

There are several reasons behind this high incidence of iron deficiency anemia among the population. Among these reasons is the inadequate intake of iron, low bio-availability and parasitic infestation.

The research group in the food science and nutrition department in the NRC succeeded to prepare an "iron formula" based on a familiar beverage used by Egyptians namely" MINT". Studies proved that this beverage promote iron absorption. This formula was successfully used to alleviate iron deficiency anemia among children during implementation within the framework of a comprehensive program of rural development.

Now beverages of 'Mint' and 'Anise' are available for market production. This is believed to be quite helpful for those who have iron or zinc deficiency and can also be used as preventive therapy.

Candy fortified with Iron and Zinc

Children need an attractive form that contains nutrients they need. A formula of candy 'Bonbon' was made which contains iron and zinc acidified with citric acid to render these minerals highly soluble and in turn bio-available. The 'Bonbon' was manufactured in one of the Candy Fabric. Panel test proved its acceptability. It was proved by experimental trial that two pieces of this "Bonbon" supply the child with more than 30% of his requirements from iron and zinc.

Appreciable improvement in health status occurred after one-month therapy with the fortified candy. This is believed to help a lot to alleviate anemia among children and to reduce growth retardation. Also it is helpful as preventive therapy.

C.1.b. Early Diagnosis and Management of Genetic Diseases and Inborn Errors of Metabolism by Genetic Mapping and Counseling

The Human Genetic Department at NRC is one of the most renowned departments for human genetics in the Middle East, whose staff are collaborating with several health authorities in performing genetic screening all over Egypt. It is considered a reference department for this activity.

C.1.c. Basic Medical Research, which includes New Approaches of Biotechnology in Diagnosis and Control of Major Public Health Problems in Egypt

Infection with hepatitis C virus (HCV) has become the most important public health problem in Egypt in addition to schistosomiasis. In Egypt, viral hepatitis along with infection with Schistosoma mansoni is the major cause of chronic liver disease and liver cirrhosis. Although HCV infection is highly prevalent in Egypt, very little information is available on the distribution of the different genotypes of HCV. In Egypt, there is a significant association between schistosomiasis and HCV infection, with the predominance of genotype 4. Concurrent HCV and schistosome infection result in much more severe liver disease than that seen with either disease alone. However, the activity of HCV infection seems to be partially suppressed in patients with schistosomiasis. Other recent reports have also shown that patients with concomitant HCV and schistosomiasis infection were characterized by more advanced liver disease, higher HCV RNA titers, predominance of HCV genotype 4, higher histological activity, higher incidence of cirrhosis and hepatocellular carcinoma as well as a much higher mortality rate.

Since concomitant HCV and schistosomiasis infection cause more advanced liver disease with higher incidence of cirrhosis and hepatocellular carcinoma as well as higher mortality rate, it has a severe effect on manpower.

Over the last 2 decades many research groups in the NRC had been extensively busy in joining several control programs aiming to reduce the transmission of the disease in Egypt. Twenty years ago the research group at the Department of Medicinal Chemistry in the NRC described new approach developing anti-tumor and anti-schistosome vaccines in animal models using chemically modified antigens extracted from the snail intermediate host. Such vaccines are heat stable, cost effective and easily prepared. The mechanisms by which such vaccines induce immunity against cancer and schistosomes are not yet clear and need further investigations. Over the last 10 years the WHO in collaboration with the Ministry of Health in Egypt conducted the Schistosomiasis Research Project (SRP). The aim of such project was to introduce advances

technologies, to train Egyptian young scientists and to apply new strategies for controlling the disease. Several laboratories in the NRC have received funds from this project. Also many young scientists have got extensive training on new approaches in biotechnology and its application to control schistosomiasis. Within this context, the NRC studied the biochemical, immunological and molecular characteristics of the cercarial elastase, a key enzyme, that the parasite uses for penetrating the human host. This work has been done in collaboration with the University of California, San Francisco, USA. The results of this collaboration were developing new serological system for testing the human exposure to early infection and developing new approaches for blocking skin penetration by the parasite with enzyme inhibitors. The blocking of invasion usingprotease inhibitors represents a new avenue for complete prevention of infection if the inhibitors could be applied in skin lotions. The immunological characteristics of the cercarial elastases from different schistosome species have been fully described. Recently, the efficacy of DNA constructs encoding for adult schistosome worms digestive enzymes and cercarial elastase as DNA vaccines was tested in animal models. All constructs successfully induced a specific humoral immune response that could the native enzymes in their precursors. Moreover, immunization with a DNA construct encoding the aspraginyl endopeptidase from S. mansoni adult worms result in anti-granuloma effect in mice. This represents a new hope in development anti-pathology vaccine to avoid complications happen in the liver due to schistosoma eggs.

Recently the NRC has established the Department of Medical Biotechnology from a group of researchers who have been affiliated to other departments. Among the several goals of this department is to develop and apply new molecular biology and genetic engineering techniques for further understanding of the molecular structure and pathogenesis of different infectious agents including HCV. The major objective of such work is to identify the responsible genes for viral propagation and infectivity. Designing oligo-nucleotide sequences that may block such genes could have a high value in treatment of HCV. The research team of the department has established several human cell lines for *ex-vivo* studying of the blocking effect of such oligo-nucleotide sequences on viral replication and/or adhesion to cells.

Other ongoing research is the study of the genome of different strains of the HCV from Egyptian patients. Drawing genetic maps for such isolates will allow not only identification of the key genes for viral pathogenesis but also for identifying the genes responsible for drug resistance. The research team has also succeeded to develop several immunology and molecular biology-based diagnostic assays for detection of active HCV infection and for following up the efficacy of anti-viral treatment. These assays have been fully developed and standardized using sera from Egyptian HCV infected subjects and have shown higher degrees of both sensitivity and specificity for detecting viral infection. Other current approach for controlling HCV infection in Egypt is to identify and molecular characterize immunogenic viral proteins of protective value which could be used as anti-HCV vaccines. The immune response against such molecules may lead to production of neutralizing antibodies that may block viral binding to liver cells.

C. 2. Non-Medical Health Interventions

This includes training of medical personnel, building of better health information systems, and strengthening of systems for procuring, storing, and developing pharmaceuticals and other medical equipment. NRC is considering it to be part of the community empowerment whether in the form of in situ or remote training using the new ICT's.

C.3. Non-Health Interventions with Health Benefits

These interventions are diverse and affect the health of people, the poor in particular. They can be in the form of providing environmental control, putting standards for clean water supply, improved sanitation and food hygiene, and safety in workplace. It also includes offering public informal education and training on risks to health, health promotion, and appropriate use of health services; regulation of health service providers; and food fortification programs. The general argument in favour of such interventions is that they have the potential to enhance the health status of the whole population, children and women in particular.

NRC has excellence in environmental issues. No doubt, environment is one of the most pressing issues in many developed and developing countries. One of the important challenges facing urban and rural planners

mainly in the latter countries is to ensure sustainability of ongoing human services such as the provision of safe drinking water and appropriate sanitation systems.

Although the development in water supply coverage has been rapid during the last two decades, sanitation systems have not been scaled-up proportionately. The indiscriminate discharge of human wastes into water bodies has created significant pollution problems with serious health implications.

C.3.a. Waste Water Management is one of the strong research areas at NRC. Wastes must and can be transformed from a disposal-based linear system to a recovery-based closed-loop system that promotes the conservation of water and nutrient resources and contributes to public health. It is worth mentioning that both the knowledge and the technology that can enable this transformation do exist. There is a gap, however, between the current availability of innovative technology and the promotion/financing of demonstration level projects as well as the development of complementary socio-economic methodologies to facilitate their implementation in many countries of the ESCWA region.

C.3.b. Renewable Energy Technologies

The following are some few ideas awaiting application:

Solar-Diesel Generation

Water Supply and Treatment Using Photovoltaic Generators

Water Pumping for drinking and irrigation

Water Purification including: Filtration - Sterilization (using Irradiation Device with PV power supply for Disinfection of drinking water)

Desalination through Reverse Osmosis.

Textile Industry

Solar hot water and waste heat recovery system is used in dyeing operation to save energy.

Ice-Making Machines for Fishing Industry

A PV/Diesel hybrid power system provided with a PV battery charger is used in ice-making for fish preserving.

Poultry Processing Industry

Solar and waste heat recovery system is used to reduce energy consumption.

Telecommunications

Solar-Diesel system is applied to secure power-supply of radio-telephone and TV transmitter systems. This enables solar technology to make modern communications possible in remote areas.

Solar-Wind-Diesel Generation

This system permits a reliable supply of water and electricity (cooling units, air conditioners, etc...).

Solar-Wind-Biogas System

This system is continuously increasing in importance as a hybrid concept. The increase in biogas in the agricultural area as well as landfill gases in the community/industrial area offer a growing energy potential which can be used in decentralized combined heating and power plants to provide energy.

Renewable Energy complements and fulfils the concept of pollution prevention and resources conservation. The importance of the use of renewable energy arises based on continuous growth of global population. These forms of energy not only broaden the urgently needed resource base, but are also free from emission of climatically active gases such as CO_2 and pollutants such as SO_2, NO_x, etc.

NRC's expertise in that field could lead to the realization of an integrated experimental agricultural and cattle breeding farm based on the exploitation of energy from renewable sources. The objective is to make use of Renewable Energy Sources available such as Photo Voltaic Cells, Wind, and Biogas as a whole integrated system.

Renewable energy technologies producing a well-adapted supply of energy are based on the different possible combinations of sources as hybrid concepts; depending upon the application and climatic conditions.

The power supply of remote underprivileged areas and decentralized consumers is a worldwide challenge of ever increasing importance concerning especially developing countries. Politically, two problems of major importance exist all over the world; over population and pollution. Building new communities in rural areas helps in solving the first one, while the use of Renewable Energy Sources (RES) is definitely a solution for the pollution problem. Many governments are now deeply concerned with these problems and making great efforts to solve them in order to protect the health of individuals in rural and urban areas.

CONCLUSION

Poverty is a serious problem of multidimensional impacts. Attacking poverty therefore cannot be an activity of a single institution. Collaborative integrated and harmonized activities are the solution. Adjustment of policies targeting poor people's communities at the national, regional and international levels is the responsibility of governments together with the international concerned agencies. Political, economic, cultural, social and anthropological research is necessary to identify the specific characteristics of the different poor communities even at the same national level and tailor well adapted implementation programs to these groups.

The National Research Centre in Cairo is a multidisciplinary R&D organization, whose authorized personnel are represented in many influential governmental committees. It can have an impact on legislative activities, strategic planning as well as implementation programs to combat poverty. Being one major implementer, NRC can provide technologies to create new job opportunities, train poor people to empower them, as well as improve health services of poor communities. Empowerment of women comes in the first place, as it has been proven that women are the poorest of the poor. Nevertheless, they are powerful asset and driving force for community development. In addition, NRC has the managerial capabilities to orchestrate and facilitate the partnership of the field implementers, who are the local governmental authorities and research teams on one hand, and the civil society including the NGO's and the local private sector on the other hand. This setup is mandatory for any approach towards combating poverty to be effective and sustainable. International concerned donor organizations are urged to be members of this setup.

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