UNEVOC Studies in Technical and Vocational Education ◆ 9

Technical and Vocational Education for Rural Development: Delivery Patterns

International Project on Technical and Vocational Education

UNEVOC

1997

Technical and Vocational Education for Rural Development: Delivery Patterns

Section for Technical and Vocational Education
Education Sector
UNESCO
1997

ED-97/WS-20

Published in 1997 by the United Nations
Educational, Scientific and Cultural Organization
7, Place de Fontenoy
75700 Paris
FRANCE

UNEVOC Studies in Technical and Vocational Education

1. *Policies and Guidelines for Educational and Vocational Guidance*
   (English and Chinese, 1994);

2. *New Training Technologies*
   (English and Chinese, 1995);

3. *A Guide for Evaluation of Technical and Vocational Curricula*
   (English, 1995);

4. *New Perspectives on Assessment*
   (English and Chinese, 1995);

5. *Functional Literacy, Workplace Literacy and Technical and Vocational Education: Interfaces and Policy Perspectives*
   (English, 1995);

6. *Vocational Guidance for Equal Access and Opportunity for Girls and Women in Technical and Vocational Education*
   (English, 1996).

7. *Promotion of the Equal Access of Girls and Women to Technical and Vocational Education*
   (English, 1995);

8. *Current Trends and Issues in Technical and Vocational Education*
   (English, 1996).

9. *Technical and Vocational Education for Rural Development: Delivery Patterns*
   (English, 1997)

PREFACE

This publication is one of the series entitled "Studies in Technical and Vocational Education" distributed by the Section for Technical and Vocational Education, UNESCO within the framework of the UNEVOC Project. UNEVOC is the acronym of UNESCO's International Project on Technical and Vocational Education, which was launched in 1992. This project focuses primarily on the exchange of information, networking and other methods of international co-operation between specialists in technical and vocational education.

This publication contains the Final Report of a *UNESCO International Workshop on Technical and Vocational Education for Rural Development: Delivery Patterns* which was held in Ottawa, Canada from 17-20 September 1996. The Report was prepared by Mr. Neil Black, Western Institute of TAFE, Australia who served as a Resource Person for this workshop. A few country discussion papers selected from the participants contributions were also included for our readers' interest.

TABLE OF CONTENTS

International Workshop on Technical and Vocational Education for Rural Development: Delivery Patterns

(Ottawa, Canada, 17-20 February 1997)

Final Report

INTRODUCTION

The UNEVOC Project

This workshop on Technical & Vocational Education & Training for Rural Development was organised as an activity under the International Project on Technical and Vocational Education (UNEVOC). The UNEVOC Project is a project of UNESCO which aims to contribute to the development and improvement of technical and vocational in the Organisation's Member States. UNEVOC works in three programme areas:

A. Fostering the international exchange of experience and studies on major policy issues;
B. Strengthening national research and development capacities; and
C. Facilitating information flow and strengthening the UNEVOC network.

In accordance with the UNEVOC Work Plan for 1996-1997, the Project, under the programme area A, will focus on the following issues corresponding to the needs of Member States:

- Raising the status of technical and vocational education;
- Lifelong and recurrent technical and vocational education;
- Orientation of education towards the world of work;
- Technical and vocational education for rural development;
- Linkage between technical and vocational education institutions and industry.

- The UNEVOC Work Plan for 1996-1997 includes the following statement:

"In order to assist policy-makers in the development of technical and vocational education in rural areas, in particular to assist in the definition of strategies for the development of the skills potential for rural industries, an international workshop on delivery patterns for technical and vocational education in rural areas will be organised in 1996. The outcome of the meeting will also be used to define UNESCO's role in future activities in formal and non-formal technical and vocational education for rural development."

Hence this workshop forms part of the implementation strategy for the 1996-1997 UNEVOC Work Plan.

Background to the workshop

Current trends in the world such as globalisation of trade, rapid advancement of technologies, urbanisation in developing nations and migration of person power within and between countries have a significant impact on rural life, which is most evident in the developing countries. Some countries' experience have shown that establishing rural industry and small and medium sized business enterprises plays an important role in the campaign of poverty erasion, in addition to the modernisation of agro-technology.

Technical and vocational education and training (TVET) has long been considered a crucial means of providing competent person power for socio-economic development in rural areas. In many cases, TVET is delivered mainly by the formal education system. However, various delivery patterns of TVET beyond the formal education system also exist and play an ever increasing supplementary role. Facing the above-mentioned changes in today's economic life, however, a serious question has been raised, ie how to deliver TVET in an effective and efficient way in order to improve rural life and to facilitate the process of development.

Workshop Objectives

The objectives of the workshop were to:

- review the general trends concerning rural development in countries that are at different development stages (eg industrialised, newly industrialised, developing and least developed countries, as well as countries in transition to market economy);
- re-define the role to be played by TVET in rural development;
- identify successful "formal and non formal delivery patters" of TVET in the rural areas; and
- formulate recommendations on future strategies to be considered by UNESCO's Member States.

PROCEEDINGS

Participants

Government officials responsible for technical and vocational education and/or senior TVET experts from Australia, Brazil, Canada, Colombia, India, Jordan, Kenya, Mexico, Poland, Republic of Korea, South Africa and the Palestine Authority were invited to participate in the workshop. All countries invited sent representatives except the Palestine Authority where a change in responsibilities just at the time of the workshop resulted in that country forwarding an apology.

A detailed list of participants is included as an attachment.

Organisation & Venue

The workshop was hosted by the Association of Canadian Community Colleges (ACCC) who organised the travel and accommodation for participants as well as the workshop venue and associated visits.

Ottawa's La Cite collegiale proved to be an excellent venue for the workshop and a visit by participants to Algongquin College of Applied Arts & Technology provided a further perspective for participants on the resources used to support TVET in Canada.

Workshop Procedure

After welcoming addresses from Dr Tom Norton, President of ACCC and Mr Marc Godbout, Vice President Education at La Cite collegiale, Dr Qian Tang, Chief Section for Technical & Vocational Education UNESCO outlined the background for the workshop within the context of the UNEVOC Project. Dr Tang also presided over the appointment of a Chair & Deputy Chairs for the workshop and explained the role of the resource person and rapporteur.

Ms Nancy Lynch from Canada was appointed to Chair the workshop with Professor Wanjala Kerre from Kenya and Dr Suk-Min Chang from Korea appointed as Deputy Chairs.

Mr Neil Black from Australia was the resource person for the workshop and also performed the role of rapporteur.

Mr Black delivered the opening paper and explained the trends impacting on rural economies worldwide and the challenges facing TVET in this context. He also provided a working definition for 'rural' and explained how Australia is attempting to refocus TVET and adjust delivery patterns to meet the specific needs of rural communities.

The representatives from each country then made a 30 minute presentation outlining the organisational structure, specific issues and developments relating to delivery of TVET within their country.

From these papers a list of issues were identified and then grouped under major headings;

- General
- TVET in Schools
- Curriculum
- Resources
- Delivery

Lengthy discussion then pursued around these issues and a number of recommendations were formulated.

The major points of discussion and the recommendations flowing from the discussion are outlined in section 6 of this report with a summary of the recommendations provided in section 7.

TRENDS AND IMPACTS ON RURAL ECONOMIES

Globalisation of Activity

A truly global marketplace has emerged which is characterised by the increased mobility of direct foreign investment and a new generation of global companies able to shift their production to whatever regions offer the lowest costs and highest profits. Rural industries, along with the rest of the economy, have not been immune to the new environment.

While growing and extracting activities continue to be tied to geographical locations close to natural resources, rural communities can not count on further processing work being kept within their regions for their own benefits in terms of jobs and wealth creation. The global 'footloose' companies are just as likely to locate such downstream production close to their markets or to regions which deliver the best profits for their operations. In many cases, it is regions and states rather than countries which compete.

In many developed countries national governments have responded to the force of globalisation through wide ranging domestic reforms such as: floating of the dollar; financial deregulation; phasing out of tariffs; lifting efficiencies in telecommunication; transport and utilities and the gradual freeing up of structured labour markets.

Technical and vocational education has been part of the reforms from the late 1980s in order to boost the skills base and diversity of the workforce.

Governments of more developed countries such as Australia, Canada and parts of South Africa have attempted to transform individual companies into more innovative, globally competitive and export oriented enterprises. The skills and attitudes of workers and unions are

becoming increasingly subject to the disciplines of the global labour markets which dictate their approach to productivity, wages and work practices (Burrel, 1994).

The challenges to technical and vocational education are to prepare a competitive workforce in which workers are trained in technical skills to increase employer competitiveness as well as skills which foster flexible attitudes, horizontal decision making and technological adaptability.

Inherent in this global culture is the expectation that individuals must take responsibility for lifelong learning in order to manage careers (Feller, 1996).

If one takes Australia as an example, the common theme in the rural industries has been one of gradual deregulation, removal of protection and a switch from predominantly bulk commodity exports to selective niche markets. Farm produce is traded in markets which are more demanding about variety and international quality standards.

Wheat growers for instance no longer have a protected trading arrangement whereby their output was bulked into a single class at a guaranteed single price. Instead, wheat produce is being graded into numerous quality standards. The Australian Wheat Board has operated for many years as a monopoly marketing system. In order to compete against multinational grain traders, the Board has moved towards becoming a diversified grain company which extends its interests into processing, storage and handling (Bolt, 1994).

Elsewhere, producers and processors in the beef industry have exploited the benefit of the growth in feedlots to fine tune cattle for particular markets and substantially expanded their exports to Japan.

The wool market demands quality standards from the paddock to the final processing of woollen garments. This trend is driving the country to broaden and transform the technical training being provided to rural workers in the industry. Similar reforms are occurring in all other agricultural activities. In many respects, rural communities are the best equipped to transform themselves to meet the new demands because they are quite accustomed to those pressures coming from outside national borders.

Rural producers are recognising the advantages of adopting new technology, doing more value added processing and improving quality throughout production cycles in an earnest effort to boost their low returns or to expand market shares.

Technical skills for agriculture in future requires a focus on quality management to meet increasing demands for international standards and niche marketing.

The restructuring response by Australia on the impacts of a more global marketplace is typical of the response of more developed countries. In developing countries, there is no less awareness of international trends and the need to be innovative and to introduce new technologies. There is also general recognition that technical and vocational education is a vital component of an effective response leading to economic development. However, many developing countries are inhibited in this response by low levels of general education of the population, particularly in rural areas, and by a lack of resources to introduce new technologies. A high proportion of the rural population is often living below the poverty line and subsistence is often the focus rather than production of goods for export. Also in some developing countries, particularly in Europe and Asia, the high percentage of very small farms restricts the use of modern machinery and the introduction of other technologies into farming practices.

Urbanisation and the Decline of Agriculture

The pressure to maintain market share is acute for primary producers as the dominance of output from agriculture has shifted to manufacturing and eventually to the service sector in the evolutionary process of development. Using figures from low-income countries the World Bank estimated that the share of the industrial sector in Gross Domestic Product (GDP) of such countries increased from 27% in 1965 to 34% in 1988, the share of agriculture fell from 42% to 31% correspondingly. Similar shifts occurred in the sectoral shares of employment. Technological progress has been the common reason for improved productivity of both land and labour, resulting in a smaller agricultural workforce.

The shift to the industrial sector in particular has led to rapidly growing urban centres in many developing countries. The urban share of the

population in these countries has doubled in the thirty years to 1990 to more than 40%. Governments have contributed to the migration to cities through development strategies such as excessive industrial protection and pro-urban bias in pricing, taxes and subsidies (World Bank, 1991).

However, there is growing recognition in both developed and developing countries of the need to introduce strategies to halt the drift to the cities. At the same time, the pressures on farmers to produce greater quantities because of low commodity prices and high costs of production means the size of farms is increasing and there are fewer people actually involved in farm production. For example, in Australia the number of farms dropped from 189,400 in 1970 to 125,000 in 1990 and it is predicted that the number could drop to 75,000 by the end of the decade (Hassall, 1994).

The Australian experience is typical of many countries and hence preventing the drift to the large cities is not so much about keeping people on farms as it is about developing a total economic and social infrastructure which enables people to live and work in rural areas, albeit often in an urban type environment. Access to technical and vocational education is seen by all countries as an essential element of this infrastructure.

Sustainable Development

Countries at all stages of development are facing serious problems of environmental degradation. Sustained development is threatened by air and water pollution, the depletion of forests, soil, and pastures.

Targeted government policies and market reforms play a critical role in reducing further damages. Rural communities need to take ownership of specific environmental actions, such as investment in production alternatives, to assist in this global task. In Australia, two-thirds of farms are managed by businesses undergoing financial uncertainties. A similar situation exists in other more developed countries, and in developing countries the income of farm households can be very low compared to urban households. The potential conflicts between sustainable production practices and short term revenues are real.

Historically poor farming practices such as overcropping and removal

of all natural vegetation in many countries has led to soil degradation and rising water tables. Salinity and declining yields have become a major threat forcing farmers to become conscious of the need to preserve the land for future generations.

The steady squeeze on profit margins coupled with community interest in sustainable development has created a strong Landcare movement in Australia over the past few years. There are now 2,200 Landcare groups nationwide, involving 30% of farmers and many urban people. The success of the movement is attributed mainly to the fact that it has been driven by the farming community and its leadership. It is about local groups tackling local issues in a locally relevant way. While government agencies responsible for agriculture, land and water conservation have contributed to funding the movement, they have appropriately remained in the facilitating and supporting role.
Landcare groups are generally formed to identify issues and share ideas on sustainable production. They witness results of trials such as tree plantings for windbreaks or low till crop planting techniques. This exposure usually helps members realise the need for more education and training. Specifically, they are keen to acquire planning skills in whole farm production, finance and business management. It is at this point that government agencies can best facilitate development by providing access to vocational education and training programmes.

At least a quarter of Australian small businesses fail because of poor management skills (McKinsey & Company, 1994) and a similar situation exists in other countries. Improvement in management capacity, including skills to manage business alliances, is even more essential for rural businesses as the globalisation of activity will increasingly lead to elaborate systems of contract farming for family businesses.

Training which integrates technical skills with financial management, management of business alliances and sustainable environmental practices will be essential to the survival of rural business.

BENEFITS OF TECHNICAL AND VOCATIONAL EDUCATION & TRAINING

The recently released United Nations Human Development Report provided the clearest value of education to the development of nations

(Barker, 1996). It concluded that countries with only modest growth rates 15 years ago which invested heavily in human development had, after about 10 years, reaped significant gains from better educated and healthier populations. In contrast, those which had enjoyed strong growth, but which had failed to plough funds back into human development, had been unable to sustain growth and often declined. "...there is strong historical evidence from East Asia that heavy national development - spreading skills and meeting basic social needs - has been a springboard for sustained economic growth... government policies are vitally important".

Even within the market friendly model of development advocated by bodies such as the World Bank, it is stressed that the essential role of government is, among other things, to provide an effective education and training infrastructure. Such provision will contribute to getting the policy fundamentals right in order to foster an environment conducive to growth.

In an exhaustive review of world development in the past three decades, the World Bank linked the benefits of education closely to the promotion of entrepreneurship, at least as powerful as cultural factors (World Bank, 1991). Education improves productivity and growth. In Peru, if farmers had an additional year of schooling, it increased their probability of adopting modern farm technology by 45%. In Thailand, farmers with four years of schooling were three times more likely to use new chemical inputs than farmers with up to three years of schooling.

In Australia, a recent survey of 2500 farm businesses confirmed the direct link between the training of the farm workforce and farm profitability (Kilpatrick, 1996). It found that education and training can improve farm management results because of greater awareness of information on innovation and the ability to use it selectively. In particular, large and small farm businesses managed by those with formal, accredited agricultural education are more profitable than other farm businesses of similar asset value; furthermore, profitable farm businesses participate in more training than other farm businesses.

In both developed and developing countries farms are mostly family owned small businesses. However the level of education of these family members is lower on the average than for workers in other occupations. Hence the need to establish a direct effect of agricultural education and

training on improved profits is important because family members usually do not need to gain educational credentials to secure a job in the family business. The Kilpatrick study in Australia revealed that while only 3% of farmers participated in formal award courses in the 12 month survey period, 80% participated in many forms of informal training, of which field days were the most popular followed by seminars and workshops. This type of informal training is now very common in developing countries as well as developed countries.

On a broader basis, vocational education and training opportunities enhance lifelong learning and help maintain the individuals' economic competitiveness. There is also a social and/or cultural development potential in educational programs and a number of countries are attempting to balance these roles against the rational economic role.

Developing countries particularly are also attempting to achieve a balance between training technicians to solve the problems for farmers and training technicians to train farmers to solve their own problems. Training technicians to solve the problems for farmers without the other strategies will probably only produce minimal impact on overall productivity.

REFOCUSSING THE ROLE OF TECHNICAL AND VOCATIONAL EDUCATION & TRAINING

Systemic Responses to Trends & Impacts

In relation to TVET different countries have responded in different ways to the impact of international competitiveness, urbanisation and the need for sustainability of the environment. However these differences mainly relate to the stage at which a particular country is at in terms of its development and the general education level of its people, particularly in rural areas. There are some common themes to the responses by both developed and developing countries and these include:

- recognition that TVET is vital to the skilling of a country's workforce and to rural development;
- recognition that rural development involves the establishment and successful operation of a range of industries and enterprises

additional to agriculture and farming;

- introduction of TVET into school curricula;
- adopting of competency based education and training;
- integration of theory and practice and/or on-job and off-job learning;
- promotion of the concept of lifelong learning;
- encouragement, facilitation and recognition of informal learning processes in rural communities;
- development of formal and informal TVET programs which are specifically relevant to rural communities;
- expansion of the range of TVET delivery modes available to rural communities, particularly through the use of appropriate technology;
- recognition that TVET must be better promoted and popularised amongst rural communities;
- recognition that specific responses are required to meet the TVET needs of rural women and where appropriate, Aborigines in rural communities.

While the above are stated as common responses it is probably true that in many countries at this point in time there is more rhetoric than actual implementation of some of these concepts. The issues that have arisen as countries attempt to implement the concepts are discussed under Section 6 of this report.

Some countries, both developed and developing, have introduced national competency standards and a national qualifications framework. Other countries including Canada have chosen not to respond in this way leaving the responsibility for TVET policy with the provinces.

There is no clear evidence at this stage in the development of different systems to conclude that a national system is or will be more or less effective in servicing the needs of rural communities.

In a number of countries there is concern that a national systemic

response may not fully deliver the benefits intended for rural communities because of a lack of inclusion of rural models and experiences in the development of 'competencies'.

Rural Features Impacting on TVET

Apart from the fact that the bulk of rural enterprises operate as small businesses, often run by the family, there are a number of other features of rural areas in all countries which demand a different approach to delivering technical and vocational education. For example distance, fuel costs, lack of public transport, lack of child care facilities, farm/work commitments, seasonal climatic cycles and weather are factors which influence access to education and training in rural areas. Often roads are poor quality and make travel difficult at any time, but particularly in bad weather.

In developing countries there may be a lack of basic services such as electricity, water and telephones.

A typical feature of the farming population in many developed as well as developing countries is a belief that the only learning necessary in terms of farming techniques can be passed on from generation to generation. In other words, there is a lack of an education and training culture. Whilst the transfer of knowledge from generation to generation or 'master' to 'apprentice' can be a highly effective educational process, without some external input the learning can be very narrow and the introduction of new technologies is usually very slow. This is particularly an issue in developing countries where general education levels are very low and much of a worker's knowledge relates to manual labour.

On the other hand rural people have many inherent qualities which can at least party compensate for adverse factors facing education in that environment. They are qualities such work ethic, mutual support, early exposure to work and capability to innovate.

Therefore in refocussing the role of TVET for rural communities, those responsible need to take full account of the rural features which can impact on the delivery of TVET and also capitalise on the unique qualities of rural people.

DELIVERY OF TVET FOR RURAL DEVELOPMENT

Following the presentation of papers by workshop participants, a range of issues relating to the delivery of TVET for rural development were identified and then grouped under five major headings. They are:

- General
- TVET in Schools
- Curriculum
- Resources
- Delivery

Issues were discussed and recommendations formulated. A summary of the discussion is included below.

General Issues

Defining 'Rural' Communities

It is difficult to give a single, all purpose definition of rural communities. The concept differs widely between nations depending on the context and purposes. In the context of technical and vocational education, it was agreed by workshop participants to view rurality in terms of the following features:

- people and production are much more dispersed than in urban areas;
- access to basic services (eg public transport, water, electricity, sealed roads) is restricted due to lack of a critical mass;
- there is a focus on cultivating or extracting primary products (agriculture, forestry, fishing and mining) but increasingly extending into initial processing.

Examples of initial processing linked closely to agricultural production includes sugar milling, grain mills, canning of fruit and vegetables, wineries, milk processing, wool processing, abattoirs and timber mills. Similarly mineral processing activities may be associated with the extraction of mineral ores and quarry products.

In some developed countries rurality also often implies a tendency towards industry specialisation, including tourism, and hence a heavy dependence on the economic fortunes of such industries.

It was therefore agreed that:

Technical and vocational education should be relevant to rural communities engaged in a wide range of activities including primary industry production and processing, manufacturing, tourism and the arts, and basic business supporting the towns.

For young people, provision which contributes to a coherent career plan, taking into account whole production processes, would enhance employment prospects within the local and downstream industries.

The greatest potential to empower rural communities lies in equipping individuals with entrepreneurship so that they can create local business, jobs and wealth.

Principles Guiding Future Strategies

In relation to future strategies to enhance the impact of TVET on rural development, all workshop participants strongly agreed that there were three basic principles which should underpin these strategies in all instances. The principles are:

- *community involvement* in planning and development is critical for success;
- programmes must be *relevant* for *rural* communities and situations;
- course structures and delivery strategies need to be *flexible* so as to meet the needs of rural people.

Popularisation of TVET

A major issue that is common across all nations is the lower status with which TVET is held generally viz - a - viz a university education. This is particularly so with young people at or leaving school and would seem to be largely cultivated by school teachers who mostly have no background or experience with TVET. Also parents tend to encourage their children to pursue a university career in the belief that no matter what the course of study there is a greater chance of employment and that the jobs are higher paid than trade and technician level jobs.

However, there is more and more evidence that in todays labour market, particularly in developed countries, that the likelihood of gaining employment with a technical qualification is higher than with a general university degree. Also people who complete a TVET program which includes extensive work experience are generally more likely to be adequately equipped for self employment in a rural community than many graduates from academic programs.

Evidence now exists in developed countries that there is a significant percentage (average of from 10-20% but higher in some programmes)

of university graduates enrolled in TVET programmes. Some are seeking to retrain or change their career, but many are young people seeking to enhance their employment prospects. Where this situation exists governments should be reviewing education policies as well as promotion strategies. Whilst it will be argued by some that any education is beneficial, when resources for education are limited governments need to allocate these resources for rural communities in a way which best assist rural development.

To assist to change the culture of societies and develop a more favourable and popular image for TVET, workshop participants suggested the following strategies:

- Introduce career education, guidance and counselling at all levels of general education and ensure career counsellors have a strong empathy with vocational careers;
- Use role models;
- Use appropriate statistics such as TVET course graduate employment rates;
- Publicity mediums, eg:
  - advertising signs
  - exhibitions
  - media campaigns
  - personal involvement
  - TV & radio interviews
  - cable TV
  - Internet
- Lobbying - using industry leaders.
- Emphasise the excellence of vocational training.
- Ensure delivery of a high quality service.
- Provide information about
  - what is happening
  - what is available
- Publicise earning potential of TVET occupations.

Levels of Literacy & Numeracy

Adequate levels of literacy and numeracy within rural communities for undertaking TVET programmes are seen as critical by both developing and more developed countries. In all countries, the average literacy & numeracy levels in rural communities are lower than for their urban counterparts. This is seen as a barrier that must be overcome in order to gain the potential benefits of TVET for rural development.

The situation is exasperated by the fact that the level of technology required in TVET programmes in order to prepare people for todays jobs is increasing dramatically in all countries and a higher level of literacy and numeracy preparation than required in the past is demanded to use the technologies required. Therefore even in developed countries, a higher level of general education is necessary in order to cope with TVET programmes and a vocational career. However, many argue that the school systems in these countries are not fully addressing this need.

TVET in Schools

Both developing and developed countries are currently implementing strategies to introduce TVET into schools. The stage at which this introduction is occurring tends to vary, but developing countries particularly see the later years of primary school as the ideal time to formally introduce rural students to TVET. However for primary and junior secondary students particularly, TVET subjects should be integrated with the more academic subjects so that the total programme is seen as a general education programme for everyone. Workshop participants felt strongly that TVET subjects should be available for **all** students and not treated as marginal to be undertaken only by those not academically inclined.

Some developed countries currently tend not to introduce TVET subjects into the school curriculum until secondary school, but workshop participants felt that an earlier introduction, particularly in rural communities would enhance the image of TVET as well as help provide

young people with useful skills at an earlier age.

An issue that arises when you introduce TVET into the school curriculum is who provides the teaching? There was general agreement that at primary and junior secondary school levels the school teachers should deliver the TVET subjects. However this teaching should be supplemented by visits to industry sites and TVET institutions, and if possible guest appearances by industry practitioners to the school. For senior secondary levels the models vary from TVET subjects taught by the secondary school teachers in a comprehensive high school, to specialist technical high schools, to the model where high school students attend a TVET institution to undertake the TVET component of their school programme. Some workshop participants felt that TVET units should be a compulsory component of all school teacher education programmes while others felt that this was not feasible. However all participants agreed that all school teachers who are to be involved with the delivery of TVET subjects should undertake appropriate professional development to equip them to effectively teach the subject(s).

Curriculum

For formal TVET programmes all countries regard curriculum as the basis for the effective delivery of TVET for rural development. However the curriculum must reflect the real needs of rural communities in terms of design, content, structure, delivery guidelines and resource requirements. Flexibility is a key element of curriculum design and modularisation is seen as the basis for this flexibility.

The curriculum should also provide the basis for an industry/ community to go forward and not just contribute to what is current practice.

Rural community involvement in curriculum development is regarded as essential in terms of ensuring relevance and gaining ownership.

While acknowledging the key role of curriculum, workshop participants stressed that much of the informal learning that takes place in rural communities may not be guided by formal curriculum documentation. However, it was felt that wherever possible, short courses should be linked to formal award courses so that people who complete a short course are given full recognition if they wish to undertake a more formal programme. *Modular* curriculum can assist this approach with one or more modules serving as a short course.

Resources

Whilst resource issues are closely related to delivery patterns, to facilitate discussion and development of recommendations on specific issues, the two have been separated for the purposes of this report.

Human Resources

One of the keys to the successful delivery of TVET in rural communities is the availability of suitably qualified and experienced teachers. However countries are having difficulty recruiting suitable teachers from rural communities and are needing to offer incentives in order to try and attract teachers to move to and stay in some rural locations. These incentives include special monetary allowances and subsidised housing. In some instances teachers are given a guarantee of a transfer to a location in high demand if they spend a nominated period of time in a less popular rural location.

Another issue is the need to provide adequate professional development for TVET teachers in rural communities so they are kept at the forefront of technological developments. There is additional costs associated with keeping teachers in rural locations up to date compared to those in urban locations and governments need to take this into account when determining resourcing policies.

To help ensure constant contact with industry practices and to provide a buffer for changing demand, most countries seek to maintain a balance

between permanent teachers and part time teachers who are practitioners in industry.

Physical Resources

All countries regard access to suitable facilities and equipment as essential for the effective delivery of formal TVET programmes to rural communities. It is also considered that the image of TVET compared to a university education is adversely affected by the lower quality physical resources often provided for TVET delivery in the past

However, with the technology available today as well as the potential for significant practical skills development to occur in workplaces, physical resource planning needs to match the particular needs being addressed. For school leavers seeking full time pre-employment programmes, traditional facilities which enable a combination of theory and practical training are required. Also residential accommodation is usually required in rural locations for some of those students and for students studying part time but needing to attend the institution for blocks of time. The most cost effective residential accommodation for government and for students is usually private board.

For students who are already in the workforce there are a range of methods being used to maximise the use of existing resources, including the workplace.

Travel is often a major issue for rural people mainly because of cost, time involved and road conditions. All countries recognise the need to minimise the amount of travel rural people need to do to access TVET, while at the same time maximising the use of existing TVET resources.

The establishment of education and training centres or **learning centres** in strategic rural locations is seen as the most appropriate approach. In developing countries it is strongly recommended that the establishment of these centres be closely integrated with the development of general infrastructure such as electricity, water and telephone services. A total

strategy will also involve initiatives to encourage the establishment of new enterprises and the provision of work opportunities.

In more developed countries the basic infrastructure for a learning centre may already exist in say the form of a technical college or campus or agricultural college.

Strategically located learning centres in rural locations in any country should provide for the delivery of formal TVET programmes as well as provide support for an expanding range of informal programmes. Such centres may also serve other purposes such as a technology development centre and/or provide an information office for rural development.

Mobile workshops and teaching units (eg sets of laptop computers) may be based at these centres but used to service other rural communities simply by the teacher driving the mobile unit to the new location and utilising an existing facility such as a school building or farm shed.

With the inclusion of appropriate technology and the application of distance or flexible learning strategies the proposed learning centres may also serve as satellite campuses for a university or large TVET institution which could be rural or urban based.

In all instances it is important that appropriate management systems be introduced and maintained which support the effective use of TVET resources.

Generally rural people are seeking access to education and training close to where they live and work. If the continuing drift of rural people to the large cities is to be arrested then all countries need to develop strategies which seek to create work opportunities while at the same time providing resources to support the delivery of TVET programs which complement the work opportunities.

To obtain the funding required to resource the delivery of TVET to rural communities, governments and the communities themselves need to consider all potential funding options. As well as direct government funding from existing tax revenues suggestions include:

- A special tax for rural TVET.
- An industry tax.
- Semi-commercial/commercial training units and programmes.
- Tuition fees.

Delivery Models

There is general recognition that TVET delivery systems servicing rural communities must be appropriate for the needs of the individuals and the communities as a whole. Requiring rural people to go to large cities to undertake TVET programs using traditional delivery modes will not assist to arrest the drift to the cities or will not likely enhance rural development.

As with curriculum, delivery modes for TVET must be complementary to the needs of the rural communities being serviced. What is most appropriate for one country or one rural community may not be appropriate for another. The extent of physical infrastructure development, the availability of TVET facilities, the level of basic education and the extent of social and economic development of a community, as well as the types of enterprises providing work opportunities, should all impact on the decision as to the most effective delivery model. In all cases it is important to take a strategic approach and to apply the principles of **community involvement, relevance** and **flexibility**.

There is not one best method for delivering TVET to rural communities but there are models of good practice that others can learn from. Some models relate to the delivery of formal programs which lead to a recognised qualification while other models reflect delivery of non-

formal or informal programmes.

Some examples of delivery models provided by workshop participants are highlighted below:

- Theory by correspondence/home study plus telephone contact with a teacher. Practical skills instructed and assessed by the teacher in the workplace;
- Theory by correspondence/home study plus tutorial support made available by teachers visiting different locations at different times.Practical by 5 or 6 weekend blocks in a technical college, plus work experience;
- Short courses for farmers for specific purposes (eg tractor maintenance, water pumps etc) - delivered in a learning centre or using a mobile unit;
- Theory partly by correspondence and partly face-to-face classes.

  Practical by work experience with local cooperating enterprises;
- Utilising university or technical institutions to do research to develop useful technologies and introduce to rural communities by training the people to adapt, use and maintain (eg cooking oil extraction mechanism in Kenya);
- Distance learning techniques utilising:
- correspondence notes; and/or
- TV; and/or
- Satellite broadcasts; and/or
- Internet;
- Delivery to satellite centres from an urban based technical institute using various technologies. Local tutorial support provided by local experts and visiting teachers.
- Utilising existing community education classes (eg in sewing) to introduce other learning, to provide information and determine other needs;
- Delivering some modules in a course in fact-to-face mode and

others by correspondence with tutorial support;

- Utilising mobile workshops (eg welding, hydraulics, hospitality, electronics, computers) to provide practical training in a range of locations;
- Theory lessons provided in local village/town facilities such as a hall or school classroom, or in a learning centre if available;
- Use of computer network, hands free telephone connection and facsimile machine for the teacher to run a class for a small number of students in each of several different locations - including private homes;
- Facilitating community groups (eg farmers) to organise and conduct field days and workshops on relevant issues - eg Landcare practices;
- Theory (electronics) by correspondence, computer program and home study supported by telephone tutorials;
- Practical by occasional labs supported by 'teacher made' video newsletters - ie videos which demonstrate practical techniques are sent to the students and then returned for re-use by the teacher;
- Integrate TVET subjects (eg agriculture) into school curriculum;
- Self study leading to assessment for formal recognition/qualifications.

RECOMMENDATIONS to MEMBER STATES

The recommendations listed below for consideration by Member States were formulated following discussion of the major issues impacting on TVET in rural areas:

Defining Rural Communities

That in the context of TVET, 'rural communities' be defined in terms of the following features:

- people and production are much more dispersed than in urban areas;
- access to basic services is restricted due to a lack of critical mass;
- there is a focus on cultivating or extracting primary products.

That TVET for rural communities should be relevant to a wide range of activities including primary industry production and processing, manufacturing, tourism and the arts and basic business supporting the rural towns.

Principles Guiding Future Strategies

That in relation to future strategies for the development and delivery of TVET in rural areas, the following principles be adopted:

- *community involvement* in planning and development is critical for success;
- programmes must be *relevant* for *rural* communities and situations;
- course structures and delivery strategies need to be *flexible* so as to meet the needs of rural people.

Popularisation of TVET

That UNESCO member states develop and implement appropriate strategies to popularise TVET (refer 6.1.3 for examples).

Levels of Literacy & Numeracy

That member states review the levels of *literacy and numeracy* being achieved from school education programs to ensure the levels are adequate to prepare students to use the technologies required in TVET programmes, currently and in the future.

TVET in Schools

That TVET subjects be integrated into both primary and secondary school curriculum for all students in rural areas as appropriate.

That member states consider incorporating TVET units into school teacher education programmes and professional development programmes.

Curriculum

That all TVET curriculum be designed and developed by curriculum specialists in collaboration with TVET teachers, practitioners and other stakeholders.

That TVET curriculum be developed to meet competency *standards* and provide for *mobility* of workers.

That in relation to the design, structure and content of TVET curriculum be delivered in rural areas:

- it must be *relevant* to rural community needs;
- there should be sufficient *flexibility* so as to allow for changes and innovations to meet varying rural community needs;
- the structure should be *modular* so as to provide for flexibility as well as ease of lateral and vertical articulation to other programmes;
- subjects/modules on *communications* and *entrepreneurship* should be a component of all formal programmes (ie programmes leading to a qualification);
- the curriculum should provide for *future* needs and strategies;

- it should be gender sensitive;
- *cooperative* implementation should be enhanced;
- *integration* of on-job and off-job learning and assessment as well as institution based theory and practice should be provided for and enhanced by the curriculum;
- environmentally sensitive practices which lead to *sustainable development* should be facilitated.

That curriculum for delivery to rural communities be revised and updated regularly.

Resources

That authorities responsible for TVET ensure that there are suitably qualified and experienced *teachers* in rural areas.

That *professional development* strategies be implemented for TVET teachers in rural areas to ensure they are at the forefront of technological and other developments.

That *learning centres* be established in appropriate rural locations to meet the needs of the specific rural community(s) and where appropriate the development of these centres be integrated with the development of general infrastructure, enterprises and work opportunities.

That the use of *existing resources* be maximised for the delivery of TVET in rural areas.

That resources be allocated for the construction and equipping of appropriate *mobile* teaching workshops and units.

That all possible sources of *funding* to support the delivery of TVET to rural communities be pursued.

That appropriate *management systems* be introduced and maintained to support the effective use of TVET resources, including communications technology.

Delivery Models

That a range of appropriate *delivery modes* be adopted for the delivery

of TVET in rural areas so as to match the needs of the various student groups and the variable factors impacting on rural communities.

That the *duration* and *timing* of delivery of TVET programmes for rural people be determined in consultation with the people concerned.

That member states review the current TVET program and delivery patterns being implemented by other members in order to learn from examples of best practice (refer for examples).

That rural communities be provided with *access* to a range of programs to support *non-agricultural* as well as agricultural enterprises.

That delivery strategies for TVET in rural areas provide for an effective *integration* of theory and practice.

That *informal* TVET as well as *formal* TVET in rural communities be encouraged, facilitated where appropriate and recognised.

RECOMMENDATIONS to UNESCO

The recommendations listed below are general recommendations for consideration by UNESCO.

That both regional and international workshops be conducted which build on the theme of this "TVET for Rural Development" workshop.

That UNESCO support the member states with strategies to popularise TVET, particularly in rural communities.

That all member states be encouraged to mobilise more resources and give more support to UNEVOC activities in their countries.

That research related to TVET be supported.

That a publication be produced which highlights best practice in the delivery of TVET.

That computer networking (eg sharing of data bases) between UNEVOC centres be facilitated.

That the existing curriculum development coordination project be continued for a further two years.

That developed countries be encouraged to share expertise and other resources with developing countries.

That training programmes in job analysis for curriculum development be conducted.

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SELECTED COUNTRY DISCUSSION PAPERS

- Brazil
- India
- Kenya
- Republic of Korea

Technical and Vocational Education for Rural Development: The Brazilian Case

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INTRODUCTION

The process of globalization associated to technological advances have raised a great interest from various countries, national and international organizations to discuss issues related to Technical and Vocational Education (TVE) in rural areas as a means of overcoming problems such as low levels of socio-economic development[1], high levels of migration to urban areas, poverty, illiteracy, and ecological difficulties like conservation of the soil, pollution of water, and so on.

In Brazil, a brief analysis of the current situation of TVE indicates that its has failed to solve all the problems related above. It has, in reality, been another element to consolidate the inequalities which are often associated to the Brazilian rural context. How? The rural population is made up by three main groups: big, medium and small land owners.

The medium and small producers are integrated into a broader market economy, but in a non favourable position, considering that:

a) The current economic structure favours the production for the external market, which is often dominated by big land owners;

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1 The concept of rural development involves all socio-economic aspects in the rural areas. However, an historical analysis of this development in Brazil indicates that it is often associated to agriculture and its consequences for the rural environment and population. This is so due to the fact that Brazil was an agricultural society until the mid 50s, and today, agriculture accounts for almost half of the national PIB.

b) These producers are often poor because their production is for subsistence and/or for the internal market. One consequence is that they have difficulties to have access to new technologies while their traditional technology tends to be marginalized;

c) They suffer, at the work level, the demands of more competitive market demands like notions of productivity, quality of production, diversification, and alternative ways of production and employment. The consequences is that although agriculture for instance, experienced a stable development during the last decades, and today, it represents 12% of the national PIB, while the agribusiness accounts for 40% of the PIB, there has been a process of marginalization of the traditional way of production in the rural areas.This process involves: the destructuration of the medium, small and familiar forms of production, the deterioration of the ecosystem, the growing migration of a large part of the rural population, thus shaking the stability of the social structures in the urban and rural centres.

All the difficulties already mentioned point out to the relevance of discussing TVE in the rural environment, in particular, if one considers that this form of rural education in Brazil is full of gaps in terms of formal and non-formal educational practices. Nonetheless, it is vital to understand, that the importance of promoting changes regarding the TVE structure, its policies and practices as a means to improve the quality of production and the quality of life in the rural context are not sufficient. Education alone cannot transform a context characterized by social and economic inequalities which are, in fact, relate to the way in which the Brazilian society has been structured. There are many elements that should be taken into account, but this paper will only consider the following two: a new concept of rural development and a new concept for TVE in this environment.

Firstly, development is understood as a process of production of goods, its distribution and consumption in a specific society, associated with all the social relations that develop around this process. In this sense, every society has a process of development in which the basic components are the forces of production - men/women, technology, means of production, and so on - which affect in different ways the various social groups. Rural development is also a process of production of specific goods which affect the relations between men/women and the social groups involved. Development in this context demands, among many things, the

production of a surplus so that the rural economy is able to grow and diversified by the development of alternative ways of production and employment, a process followed by the improvement of the quality of life of the various social groups.

A brief analysis of the rural development in Brazil shows that the gains from the rural production, the access both to the new technologies and to the means of production are not socialised among the rural communities. They are concentrated in the hands of a few proprietors and/or are transferred to the industrial sectors outside the rural areas, but which are directly linked to this form of production - the agribusiness. Thus the majority of the population is excluded from this form of development. Some of the reasons are their low level of participation of this process of development, the low level of awareness regarding their role as citizens able to interfere in this process, and their high level of illiteracy. For instance, 16 million rural inhabitants were considerate illiterates in 1993 (PNAD, 1993). In addition, 68,2% of the rural population were considered to be living in state of poverty in 1989 (IBGE, 1991).

It becomes vital thus to create a new concept of rural development which could integrate the rural population into a process in which the gains are socialised its gains, as well as the rural population is stimulated to participate actively of the political decisions regarding their sector at all levels. In this sense, a form of education which enables the rural worker to understand, interfere and innovate is vital. This form of education must depart from the principles of the very own rural work. It should not focus only on the betterment of the workers activity, but also promote the understanding of their historical reality, of their way of life, and the relations that they maintain with other groups. In this way the knowledge and the technical abilities acquired can contribute to their real integration to the processes of change of the social relations in which they live. In other words, participate, as agents, of the essence of a different process of rural development.

Secondly, an analysis of the role of TVE in the rural context requires the development of a new concept of technical education. This is an interdisciplinary concept that is going to be called in this paper **"technological education"**. It derives from a broader conception of education which uses the rural work, the knowledge that it embodies, the universalized knowledge, and the use of new and/or traditional technologies as instruments for the integration of men/women into their

environment as citizens capable to discuss, interfere and participate in their own political, environmental, educational and socio-economic development. The fundamental characteristic of this form of technological education is its capacity to document, systematize, understand and use the concepts of technology and history so that these become important elements in the processes of teaching, learning, understanding and researching. This characteristic goes beyond the limits of a simple application of a technique detached from the reality of the rural work. The understanding of the rural work, its principles, its history and, above all, the association between theory and practice, are the vital factors that allow individuals to promote technological innovation, the transformation of both rural employment opportunities, as well as economic activities so that rural workers and the country could benefit.

This concept does not accept the technique as autonomous from the society and, consequently, detached from economic and social outcomes that it causes. It is the result of the historical social relations of production that are established in a society and, that ultimately, determine the form of its economic development. In the Brazilian case, the technique of work or production is related to de inequalities between individuals, classes, sectors and regions. Because of that, it is necessary to have close relationship between the understanding of the scientific and technological developments and the knowledge of the users of the technologies like students, teachers, researches, and workers to enable them to understand their role in the technical transformation of the work and the production, and thus understand which techniques contribute or not for the social inequalities.

THE BRAZILIAN TRENDS IN RURAL DEVELOPMENT

A Brief Historical Overview

During the 30s, 40s and 50s, Brazil remained an essentially agricultural society with 66,0% of its economically active population working in the primary sector, and 70,0% of its inhabitants living in rural areas (Lakomy, 1995). During this period, the Brazilian rural sector was not seen as vital for the development of the country. Rather, during the 50s the government strategies envisaged a shift from an agro-export to an urban economy through the creation of an industrial complex. It thus adopted an economic model based on "import-substitution policies". The

model carried on measures that enabled the transfer of the national capital accumulated by the agro-export sector to finance the industrial sector. One consequence was that the former was heavily taxed while the agricultural internal market was expected to provide cheap products for the growing urban workforce.

During the mid-60s, 70s and 80s the military government consolidated and expanded the import-substitution model previously introduced. The agro-export sector continued to become somewhat important, and exports of primary products continued to increase, but at slower rates. For instance, between 1947 and 1979 the ratio of exports declined from 14,8% to 6,7% (Serra, 1982).

Some of the policies adopted for this sector included the import of food. This import promoted the diversification of the agricultural sector through incentives to the production of soy, wheat, and citric products, as well as promoted the development of industrial complex connected to this sector These measures, however, had the following contradictory outcomes for rural development:

- The agro-export sector and the cattle breeding continued to grow due to the power of the rural oligarchy, while the internal agriculture remained an activity conducted by medium and small producers;

- The resources that proceeded from the production of coffee production enabled the process of modernisation, via new technologies, of the agricultures of soya and wheat;

- The process of modernization favoured the export-agriculture but 1) they reduced the number of medium and small producers, and 2) accelerated the process of migration initiated during the 40s. In both cases, small and medium producers sold their land due to the lack of financial resources to acquire new technologies, and migrated to other regions. For example, during this period, Brazil turned out to be an urban society in which 68,0% of the population became concentrated in urban centres whereas 32,0% continued to live in rural areas in 1980 (Lakomy, 1995);

- The development of the agro-industrial complex and the migration process lead to the concentration of the rural production in the South and Southeast regions of the country. Such concentration increased the

poverty in the North and Northeast;

- The growing modernization-industrialization of the agriculture oriented towards the external market, and dominated by a rural oligarchy, led to the marginalization of the traditional methods of production. The consequences were two fold: 1) a greater concentration of land, and 2) greater levels of poverty;

- Finally, the changes mentioned above transformed the relations of work characteristics of the rural context. These relations were traditionally based on the ownership of a land. They changed to paid and temporary work, the so called "bóias-fria", or rural workers that work under terrible conditions, receiving very small wages, and without any kind of social security or work stability.

Current trends

Although Brazil is nowadays the 9th economy in terms of GPD, it experienced, during the last decades, a series of difficulties[2]. Seeking to overcome these difficulties, the current government has been trying to adopt liberalisation policies to move away from the import-substitution model, and also become more competitive at national and international levels.

But how this new approach has been affecting the rural development in Brazil? Commentators (Goldin and Rezende, 1993) argue that the government has never adopted clear and long-term policies for rural development. Most of the policies were not put into practice due to political negotiations between the rural oligarchy and the government, or changed rapidly from government to government. Only four key elements for the development of the sector remained - although they have also been subject to a great degree of variation according to each government: the agricultural credit, the programmes of technical assistance, the insumos, and the research programmes on agriculture and cattle breeding.

2 These difficulties were caused by increased internal and external competition, higher levels of the quality of the external production, technological advances, and so on.

The new government, as the others, has not demonstrated a strong position that could suggest the existence of clear and long-term strategies aimed to promote rural development. Instead, the four key elements for this development have been affected in a negative way. The research activities have diminished considerably due to the reduction of financial resources from the government. The same happened with the programmes of technical assistance. In addition, the programme of agricultural credit has been reduced across the country, and thus has affected the medium and small owners even more. Some of these are grouping in order to survive through the acquisition of new technologies in order to increase their production. Others, who are unable to do the same, tend to be marginalized because their production is too small even for the internal market.

These facts point to the lack of governmental interest in the development of the rural environment. As it happened in the previous decades, policy makers still believe that economic growth could be achieved through the technological innovation of the Brazilian industrial complex. In addition, Brazil is today an urban society in which 78,3% of its population lives in the urban areas while only 21,7% lives the rural areas (PNAD, 1993). Such position could cause the following consequences: a) the decrease of the rentability of all producers, b) a negative impact on sectors related to the agrobusiness (for instance, the national industry of agricultural machines, the trade of fertilizers) (Suzuki, 1995), c) the deepening of all the problems already mentioned, and d) even more poverty, low level of education, migration, concentration of land, and the use of a growing workforce made up by children.

Although most of the states have no clear and long-term policies for rural development, some of them show a certain concern with the issue. For instance, the Paraná state, has developed a special programme to increase the quality of life and the quality of production in some regions. The main targets are: ecological problems, migration, poverty and illiteracy in the rural areas. Unfortunately, experiences like this and others are not sufficient enough to change the current and complex situation, in particular, because they do not attack the real problem: the inequalities characteristics of the Brazilian socio-economic structure and the low level of general and professional education of the rural population.

THE ROLE OF TVE FOR RURAL DEVELOPMENT

An analysis of the process of rural development in Brazil with regard to general education and TVE points out to a very important point. That is: **the expansion of the tertiary sector during the last decades did not require, and was not followed by an increased level of general[3] and professional education of the rural population.** For instance, the most recent national survey indicates that although there has been a reduction in the percentage of illiteracy, 40,5% of the rural population is still made up by illiterates (PNAD, 1993). That is, 11.050.032 individuals cannot read and write. In addition, considering general education, available data shows a very low level of education: only 3,4% of the children finished primary school in the rural areas in 1993, while only 7,5% of youngsters finished secondary school in the same year (PNAD, 1993).

Having in mind this consideration, which role has been played by TVE in the rural context? Which should be its role in the future?

However, before discussing this question, it is important to describe the way in which the current technical and vocational educational rural system is structured, provide some background information about its development, and point out some critical points regarding such a form of education. This system is divided into two separated systems: one is the non-formal and the other is the formal educational system.

The Non-Formal Educational System

The non-formal TVE system is made up by experiences carried on by ONGs, agricultural co-operatives, and private schools run by co-

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3 With regard to formal primary and secondary education or general education, it is argued that the way in which this education has been offered has, in reality, reproduced the socio-economic underdevelopment in which the majority of the Brazilian rural population is found. In general terms, various sectors of this population have been marginalized due to problems like: difficult access to schools, they reflect values and contents which are common to urban schools, that creating a great gap between the rural school and the context in which it functions. This situation is reflected, for instance, in the high rates of dropout and illiteracy in rural schools.

operatives. It is quite difficult to account for these experiences because they tend to be short-term programmes, there is no national data base with information about them, and they vary according to the different regions.

However, Brazil has one major experience in this area called "**Serviço de Extenção Rural**" (The Rural Extension Service), or just "extencionismo rural", created in 1956, through an agreement between Brazil and the United States. The programmes of extencionismo rural are co-ordinated by a federal body, the SENAR (National Service of Rural Apprenticeship), and are directed towards the agricultural sector.

During the 60s and 70s the programmes of extencionismo rural, following the import-substitution economic model, were directed towards the promotion of the agricultural sector as a means to finance the establishment of the Brazilian industrial complex, the agricultural industrial sector, and thus contribute to the country's development. SENAR put into practice an enormous amount of programmes: some were successful, but, in many cases, were not followed, while other programmes failed for the lack of understanding of the peculiarities of the regions or the contradictory motives behind the programmes) between industry people, farmers and technicians. It is impossible to account for all these programmes, therefore, attention will be given to some critics that could contribute to the betterment of the extencionismo rural in Brazil as a non-formal way of TVE.

One criticisms that could be made refers to the gap between the programmes objectives and the reality of the majority of medium and small rural owners. In other words, their main objective was to promote development through the incorporation of new technologies, which could be acquired through governmental credit. This objective, although valid, did not take into account that the so-called process of "modernisation" of the agriculture, via new technologies, which benefited only the big proprietors. These were able to afford the new technologies, as well as negotiate the credit conceded by the government.

In addition, the process was very heterogeneous - it varied according to the peculiarities of the different regions. Moreover, this process did not always affect the whole production process, but was often limited, for instance, to the preparation of the soil via substitution of animal by machines or via the use of chemical products. In both cases, the small

and medium owners were unable to improve their whole production system but only part of it. They tended to have a partial perception of the way in which their very own system could be improved. Besides this improvement always depended on their reduced capacity to acquire new technologies.

Another criticism refers to the philosophy behind the programmes. Influenced by the Human Capital Theory, these were much more concerned to improve productivity standards through **technical assistance** rather than through an educative process according to which technicians could teach the rural population to solve their own problems. For example, due to a certain problem, the owner would call the technician, who would resolve it, but without including this person into the process of teaching how to deal with this problem in the future. In other words, the programmes tended to ignore:

- The fact that the rural population has a knowledge acquired through work, therefore, was able to learn, again through their work, new techniques in a non-formal way of technological education, as well as generate technological innovations;

- The emphasis on the provision of technical assistance limited the possibility to include and enable the rural workers, through an informal process of education, to participate actively in their own socio-economic development.

Nonetheless, during the 80s, the high levels of rural migration and poverty (despite the economic growth experienced) influenced the adoption of a new approach. The government created the EMBRATER (Brazilian Enterprise of Rural Assistance) and, in each state, the EMATERs (State Enterprise of Technical Assistance and Rural Extension) which continued to provide technical assistance, but under a new emphasis. The emphasis was on the participation of the population in the process of rural development - the so-called "**Participative Planning**" - through a form of non-formal education.

Thus, in order to achieve the objective above, the aims of the programmes of extensão rural changed to the provision of technical education for medium and small farmers and rural workers in order to enable them to use their means of production, as well as to enable them to incorporate, by themselves, new techniques into their production

systems. The programmes goals are, more specifically:

- To promote rural activities capable of maintaining or generating new forms of employment;

- To stimulate the association of individuals into groups so that they have a better access to the means of production, the process of industrialisation of their products, and the market;

- To educate the population to use in an adequate way the soil and the natural resources available;

- To reduce the high levels of migration and poverty.

The new approach given to the programmes of rural extension - as a form of non-formal technical education - has the potential to somehow achieve some of the goals above, in particular, if one considers that these programmes comprise large part of the rural population. With regard to the population that could be reached by the programmes, in the state of Paraná, for instance, the EMATER has assisted, since its creation, 221.805 individuals. That is: 185.578 families, 4.387 rural workers, 4.700 youngsters and, in 1995, 149.823 families of small producers (EMATER, 1996).

However, the programmes still faces two problems. On the one hand, the current government has reduced considerably its financial support which has, in some states, paralysed the activities of some of the EMATERs. On the other hand, the programmes just attempt to reduce some of the difficulties in the rural environment. These do not attack the real obstacles for rural development: the concentration of land, the concentration of income, and the low levels of education of the rural population so that they could participate in the process of development.

The Formal Educational System

The formal educational system offers primary, secondary and tertiary technical education. There are federal, state (both tuition free), and private schools.

This system was created in 1831 when were established the first professional institutions for the formation of agriculturists. The next

major change in the system took place during the 30s when these schools started to provide primary and secondary vocational education for poor children. The courses offered were: technicians in agriculture, horticulture, zootechny, and veterinary practices. The following changes occurred in 1946 with the creation of the first technical courses in domestic rural economy. These courses were offered exclusively for women which, according to Franco 1987), indicates that:

During the 70s, according to the import-substitution-model, and under the influence of the Human Capital Theory, the federal agricultural schools had to adjust themselves to the demands imposed by the expansion of the Brazilian industrial sector. How? As the agricultural gains were used to finance the country's industrial development, technicians, with secondary level, were needed for the improvement of the production and productivity of the agricultural sector. Thus two functions were created: technicians as "agents of services" and as "agents of production". The former was educated in order to: a) provide technical assistance for medium and small producers, and b) promote links between firms, specialists, and producers. The latter could either explore, as an owner, the use of a land through modern technologies or work as a farm administrator (Franco, 1987).

Since then, the number of federal schools has not experienced a substantial growth. For instance, in 1985, there were 33 schools (Franco, 1987) whereas today there are 41 federal ones (MEC, 1995). In other words, during the last ten years, only eight schools were created to: a) assist 47,8% of a rural population made up by individuals between 0 and 17 years old (PNAD, 1993) and b) assist 27,8% of a population of children over 13 years old who are already working in the tertiary sector (PNAD, 1993). As shown in Table 3, these schools attend only 13.648 students and have 1.395 teachers. In addition, they are concentrated in the poorest (Northeast) and the richest (Southeast) regions of the country.

Considering that at the time the paper was written, there was no available data about the number of state schools in Brazil[4] nor about the courses

4 In this respect, information given by a representative of the Paraná State Educational Secretariat, indicates that, in Brazil, there are around 24 state schools in the whole country. Around twelve schools are located in the Paraná state and twelve in the São Paulo state.

that they offer, as well no information in the Ministry of Education or any State Educational Secretariat about the private schools, this document will focus on some aspects of the federal schools in Brazil.
An analysis of the federal TVE schools suggests that this form of education has not being able to meet the past and current demands of the rural sector more specifically:

a) The current governmental proposal for this system aims to educate individuals able to both provide technical assistance and transmit their technical knowledge to small producers, and thus enabling the latter to learn this very own knowledge. However, researches undertaken with rural technicians (Franco, 1985) indicate that these tend to emphasise only the technical side of their activities. For instance, in a research conducted by Franco Franco, 1985) in technical schools located in 3 states indicates that 64,5% of the respondents considered themselves as agents of services, with a strong emphasis on the technical side of their activities. That means, they saw their role as agents able to provide technical assistance to the rural population, but not as technicians able to teach them the technical aspects of a certain activity. In addition, 31,5% of the agents of production interviewed emphasised functions such as co-ordination, supervision and promotion of links between farmers, specialists and the market. Only 3,5% of the interviewees incorporated into their technical functions the role of what she calls "agents of social change". That is, they perceived themselves as providing technical assistance, but also as promoting the rural population awareness with regard to their own work conditions, as well as contributing to their organisation into groups.

There seems to be a gap between the political discourse and the current formation of rural technicians. The strong emphasis on the technical formation of the individuals puts into question the role of this technician. More specifically, if rural development is associated to the idea of a greater process of socialisation of the gains derived from the production, the development of alternative ways of production and employment, and the improvement of the quality of life of the rural population, the current way in technicians are being educated only reproduces the socio-economic inequalities already discussed. How?

Firstly, the emphasis on the provision of technical assistance or "solving problems" makes more difficult the socialisation of the knowledge associated to the new technologies and rural practices. The producers

continue to rely on this assistance rather than combine their practical knowledge to the theoretical knowledge of the technician, and apply this combination to understand and resolve their own problems.
Secondly, such an emphasis also neglects that in order to promote a different form of development, a technician also needs to understand the way in which the Brazilian rural context has been structured, and thus perceive the importance of being an agent able to also promote the rural producers' and workers' awareness to their conditions and their organisation, and thus contribute to a greater participation in the decision-making processes regarding their own socio-economic development. These three factors could somehow overcome difficulties such as migration and poverty by providing more conditions for this population both to stay in the rural environment and to develop alternative forms of production (through the use of new or traditional technologies) and employment.

To sum up, the Brazilian federal schools **are far from providing what is understood as technological education.** The emphasis on the transmission of techniques neglects that technology is not only a product, but is also a complex process which involves diversified problems of operation and adaptation. In reality, the application of a certain knowledge that involves the use of an instrument does not only involves its manipulation, but is an intelligent act of the user who keeps in his-her mind and attitudes his-her creativity in order to become different from a person who only repeats actions. These schools, therefore, not only educate individuals to repeat techniques, but also tend to limit their chances to apply their theoretical knowledge in different situation, and thus be able to meet the challenges imposed by the process of technological innovation in conceptual and operational terms.

Thirdly, the way in which the majority of the technical schools are organised as boarding school) limits the access of girls and women to TVE in the rural context. The law that regulates technical education in this context also reinforces this discrimination: Article 51 reinforces the equal access of men and women to TVE. However, Article 52 recommends that: a) technical education should be given in schools only for women, b) women should not perform work that could cause any harm to their health, and c) all courses and work practices should take into account the personality of the women and her role at home.

The same research undertaken by Franco (Franco, 1985) confirms this fact. The author found out that in 1995 only 3% of the students of were women. According to her another element that contributes for the discrimination of women in this kind of technical education is the teaching methods used. According to her:

b) **The system of rural TVE has also been unable to follow, and in most of the cases incorporate, the technological developments that are taking place in Brazil or outside.** At least four interrelated reasons could be given for the fact that this form of education is considered to be falling behind the current technological changes.

Firstly, there has been no significant changes in the curriculum and the teaching methods which could indicate that the new technological developments have been incorporated into the courses offered. Consequently, teachers-technicians are unable to promote the diffusion of these developments in the rural communities.

Secondly, the curriculum seems to take no consideration of the diversity of the country, as well as the peculiarities of the various regions. It tends to focus on the use of certain technologies and practices as if they could be applied in any part of Brazil.

Thirdly, it also tends to take no consideration of what could be called **"technologias apropriadas"** (appropriated technologies). In other words, technologies which are developed a) by the various rural segments of a community b) for a specific situation. These technologies not only embody a specific cultural identity, but they also have the potential to promote the technological independence of a community.

In Brazil, some experiences have been made but failed due to the lack of support and understanding by the government. For many, technologias apropriadas are seen as sub-technologies or second class technologies rather than instruments with the potential to promote the development of rural communities. They have this potential if both the theoretical and practical of the technology, the new production processes, and the human dimension involved in the development process are understood by the workers in a critical and interpretative dimension. One successful example is the Federal School of Bento Gonçalves, in the South of Brazil. It is located in a region in which the main production is the wine, therefore. The school has adapted its courses, its teaching methods, and

its new and traditional technologies according to the characteristics and needs of the region and its main production.

Finally, although Brazil has one of the world greatest research institutes in this area, the EMPRAPA (Brazilian Enterprise of Agricultural and Cattle Breeding Research), created in 1972, the developments that take place are not socialised. In other words, only a small proportion of rural producers have access to them. This limited access creates a gap between the discovery or improvement of new technologies and their diffusion into the educational context. In addition, teachers, who are not always qualified, also have difficulties to become up-dated with the new developments and, consequently, transmit these achievements to their students.

SOME ALTERNATIVE FORMS OF TVE

The analysis above indicates that the formal and non-formal TVE Brazilian systems are far from being able to promote the rural development as it is understood in this paper. However, many experiences have been made or are being made which could be seen, despite all difficulties, as alternative and efficient forms of technical and vocational education. Two examples, both in the Paraná state, are going to be analysed: the "Programa Casa Familiar Rural" the (Familiar Rural Home Programme), a non-formal case of TVE, and the CEFETs (Federal Centres of Technological Education), an experience of formal education.

The Familiar Rural Home - FRH

In 1994 was created the FRH programme[5] which involved the government of the Paraná state, the State Educational Secretariat, the State Secretariat for Urban Development, the State Secretariat of Agriculture, the ARCAFAR Regional Association of Familiar Homes), and the municipalities. This programme sought to create an educational structure which could reflect the local and regional peculiarities of small and medium producers, through a methodology called **"Pedagogia da Alternancia"** (Alternation Pedagogy). The FRH differs from a formal

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Until December 1995 there were 10 schools, with 750 students. It was expected that by the end of 1996 there will be 30 schools, with 2.250 students.

school in three ways:

- It is created based on the necessity, awareness and will of a group of farmers who, in association to the bodies above, are motivated to get together in order to establish their own professional school;

- It assumes that agriculturists, for instance, have a knowledge which is acquired through their work, but which is often neglected by their sons and daughters. The programme thus aims to motivates the students to combine this practical knowledge to the theoretical knowledge learned at school - knowledge which always reflects the needs of a community;

- It is also a form of continuing education since it allows the students, either alone or in groups, to come back to the schools, at any time, in order to acquire more knowledge.

Objectives: The programme aims to provide professional education to youngsters so that these could be able to: a) improve the production and productivity of the medium and small producers, b) contribute to the organisation and development of the community, and c) remain in the community.

Population: Sons and daughters of farmers with more than 14 years old who have concluded primary school.

Duration: 3 years, full-time.

Strategy: The schools tend to be divided into 3 groups (20 or 25 students each). Each group has two monitors: 1 Agriculturist Engineer and 1 Agricultural Technician.

Methodology: It is the Pegagogia da Alternancia, in other words, the student stays 1 week in the FRH and 2 weeks in his/her farm. The basis for the student s learning process is his/her own work in the farm and in the FRH. For instance, when they are at the school, the students have theoretical discussions about an issue. At home, they confront the things that they have learned at school with their everyday practice, as well as have the opportunity to discuss them with their parents. The reunion between theory and practice is thus taken back to school for more discussions.

Assessment: The assessment is based on the student's work at both home and the FRH. It involves parents, professionals and monitors. It aims to verify if the student has acquired the new knowledge through the "method of alternation".

Evaluation: The first global evaluation of the programme will take place this year. However, **some problems** have already been detected: a) the heterogeneity of the students which makes difficult both the teaching and the learning processes, b) the low level of qualification of the monitors who not only come from the different bodies involved in the programme, but also receive different wages, c) the general and very basic notion that students acquired of basic courses like Portuguese and Mathematics, and d) the difficulties to obtain financial resources to maintain the schools[6].

Despite the difficulties, students from the FRH are experiencing a form of non-formal technological education. Different from the agro- technical schools, these individuals have a chance to understand, research and use concepts of technology and history that has the potential to take them beyond the limits of the simple application of a technique. Their understanding of their work, its principles, its history and, above, the possibility to get together theory and practice, enable them to become more flexible *vis-a-vis* technological innovations, the use of traditional technologies.

In addition, due to the problems that come up during the processes of operation and adaptation of a technology, they can exercise their creativity to solve problems that are common to their reality. These students can also solve these problems by contributing to the development of "technologias apropriadas", and thus avoid negative consequences for their environment, culture, society, and economy. The use and acceptance of this technology give them another advantage over the technicians graduated in the federal schools: the former, by knowing the community,

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The municipalities, are expected to finance most of the programme, through loans given by the State Educational Secretariat. However, the present economic conditions of the great majority of the municipalities puts into questions this form of financing. Considering its conditions, one can argue that it would be almost impossible for these municipalities to afford such loans. Thus a new form of financing should be considered in order to keep the project alive.

learning about it, participating in the production and adaptation processes, and using this technology, has better chances to understand the relation between his-her own culture and the technology, remain in his-her community, and use technologies that have the potential to meet the needs and aspirations of the community.

THE CEFETs

The CEFET-Pr (Federal Centre of Technological Education at Paraná) is a public and tuition free technical institution located in the capital of the state of Paraná: Curitiba. Although it is subordinated to the Ministry of Education, it has administrative, didactic and disciplinary autonomy. CEFET-Pr offers secondary, graduate and post-graduate technical education.

The reasons to choosing the CEFET-Pr have been twofold. On the hand, this institutions is considered to be the best technical centre in Brazil in terms of the quality of the courses, the quality of the graduates, the close relationship with the current technological developments as well as with the industrial community, and it is also a recognised centre of technological research. On the other hand, **the centre launched in 1991 an innovative project which involved the creation of 5 other CEFETs in 5 different parts of the states' countryside.** The other centres were established in the following small cities (around 60 thousand inhabitants): Medianeira, Pato Branco, Cornélio Procópio, Ponta Grossa and Campo Mourão.

In addition, the importance of presenting this case is the fact that these 5 institutions have 6.600 students, that is, **they have almost half of the number of students enrolled in the whole Federal Agrotechnical System in 1996** 13.648 students). Table 3 indicates the number of students in the various centres in 1996:

The centres outside Curitiba offer, at secondary level, the 6 following courses according to the number of students in 1996: food or food engineering (777), mechanics (678), electronics (576), eletrotecnics (524), industrial design (499), and eletromechanics (248). At graduate level the courses are offered only by the Pato Branco Centre. These are, according to the number of students in 1996: Economy (258), Administration (251), Agronomy (153), Data Processing (141), Mathematics (99), Language (39), and Science (36).

Objectives: The other centres were created according to four principles: **regionalização** (to become regional), **interiorização** (take the school to the countryside), **descentralização** (de-centralisation), and **extensão** (extension) the activities and the potential of the "mother-centre" for the development of the rural areas. The centres thus cannot be considered, in a formal way, rural technical schools. However, the 5 technological centres still are rural schools because they were created in order to solve problems that are characteristics of each region (like migration, poverty, environment, production, and so on) through the use of an advanced technological cultural that seeks to reflect these peculiarities.

In this respect, **the major concerns are** the conservation of the environment, the development of adequate technologies for the production of food and other products, the maintenance of the young population in their region, and the improvement of the quality of life of the population. For example, the city of Medianeira is a centre directed towards the production of meat, that is, a pole which seeks to develop technologies for the production of meat in the West of the state. Thus it was created a course, at secondary level, of food or food engineering that already has 556 students. Even its course in Eletromechanics (527 students) has been design to meet the demands of this production that **the students can remain in the region** as promoters of technological and socio-economic development. In Pato Branco city, for instance, there are tertiary courses which could be considered as "urban" ones. However, there is a strong concern within the centre to promote a process of extensão rural through a greater integration between teachers, students and farmers in order to facilitate the organisation of the latter into co-operatives.

The Establishment Process: Four reasons influenced the decision to create the centres in small cities. Firstly, the regions in which these are located tend to have a more equilibrated level of land concentration and income distribution. There are growing agricultural complexes which depend on a large net of medium and small producers - a fact that maintains a certain economic equilibrium. Secondly, the centres are located in poles which are in a process of strong development associated to the production of certain goods. This process thus has the potential to generate more development for the whole region. Thirdly, the creation of the schools involved political negotiations with the cities' mayors which made easier for them to be established. Fourthly, the CEFET-Pr aimed to attend the rural needs of the whole state, therefore, created schools in different regions of the state.

Population: Sons and daughters of small and medium farmers, and parents working in commerce, baking, and so on.

Evaluation: There has been no evaluation due to the rapid expansion that affected the planning, following and evaluation processes. However, some

difficulties can already be pointed out. On the one hand, the rapid expansion of the CEFET-Pr required, and still does, a great amount of investment. This investment has been difficult to be made by the mother-centre. In this sense, there might be necessary to consider alternative form of finance - may be a form of accord between the CEFETs and other federal, state, municipal and co-operative bodies.

On the other hand, the centres find themselves in a contradictory situation: at the same time, they want to keep the main urban characteristics of the mother-centre, but also want and need to reflect and express the peculiarities of their regions. There will be a time in which they will have to establish their own rural identity rather than remain as an "industrial copy" of the main centre in the rural environment.

In addition, these are not technical schools, like the federal ones, but research centres for the technological development of certain production processes. This important characteristic points out to the importance of creating, in the future, both agricultural courses and other technical courses for example: technology of meat) to meet certain regional demands. In this case, these courses could be the motor for the technological appropriation of new and old technologies. They can also be the motor for the development of "technologias apropriadas" in order to solve problems of a certain community so that negative effects for the environment, society, economic and culture aspects of the region be avoided.

Another difficulty refers to the presence of girls and women in the courses. Although these have access to them, **girls and women tend to concentration in the courses that are socially related to female activities such as food and industrial design (a former decoration course)**. For instance, in Medianeira, at secondary level, in the course of food 78,8% of the students are female whereas in eletromecanics 87% are male students (a patterns that tends to repeat in the other courses in the other cities). The only tertiary course that has a majority of women is Language (90%). These percentages indicate the importance to find out ways to improve the participation of girls and women in all courses specially if it is considered a) that the female rural labour force has increased from 37% to 44,8% during 1881/90, and b) they have also increased their level of general education. For instance, 55,7% of girls concluded primary school in the rural context while 57,9% finished secondary school in 1993 (PNAD, 1993).

Despite the problems the experience provided by CEFETs, as a form of formal technological education is another elements puts into question the technical education given by the federal agricultural schools. Firstly, the latter are educated to be employees while the former are being educated to be owners or to provide assistance to medium and small producers so that these could

become more independent and aware of their life conditions. For instance, many students who have already finished secondary school have shown an "entrepreneur spirit" through the establishment of their own business related to production of their region. This spirit is related to their perception of technology as a historical, political and socio-economic process which involves more than technical knowledge. It involves the capacity to understand, create, adapt, organise and produce technologies, products and services that can produce innovation and transformation of the economic activities of the region for the benefit of the community and the country.

THE ROLE OF TVE FOR RURAL DEVELOPMENT: FUTURE STRATEGIES

The discussion above has shown the important role that TVE has for the development of the rural environment. It is, without any doubt, a major task to be conducted by the government, policy-makers, educationalists, curriculum developers, formal and non formal schools, and the rural population. The basic condition for this future role depends, in other words, of the design of a new and long-term national plan for TVE involving the efforts of all the individuals and institutions above.

This plan, in the view of the authors, needs to be based on a set of strategies:

- **The adoption, by the government, of a national, long-term and clear plan for rural development** with emphasis not only on the agriculture and cattle breeding sector, but also on other sectors which have never been considered. For instance, the production of sweets in the Northeast, the weaving sector of the North, Northeast and Centre, and so on;

- The new economic plan needs to include policies considering alternative ways to promote an egalitarian diffusion of new technologies among small and medium producers;

- One of the basis of this project needs to be a national educational plan based on the concept of **technological education so that the needed population could learn that they are citizens with the right to participate in their own process of development**.

Technological education is a concept that is in the context of education, technical education, science, technology, work and production. It is a process that enables men and women to understand and contribute for their social progress in the work place, the production process, and the social organisation of their rural community. It is the technological education thus that has the potential to "open the mind" of teachers, technician and rural workers to better

understand their practices, traditional or not. This understanding goes beyond the simple act of making because it involves not only *what to do*, but also *how to do it, why, for whom it should be done.*

- Having in mind the idea of technological education, this educational plan should: 1) improve the quality of the existing formal system, as well as create new schools, 2) promote profound changes in the curriculum that take into account new technological developments, the participation of women, and the peculiarities of regions, 3) improve the qualification of the teaching staff, for instance, through distance learning and 4) facilitate the access of the schools to new technologies, 5) change the organisation of the schools in order to increase the access of girls and women to TVE;

- The government and educational bodies should also: 1) create a national data base with information about the formal and non-formal TVE experience in the different states - this information could be the basis for a curriculum change, 2) bring closer the formal and non-formal TVE systems in order to promote the exchange of ideas and experiences undertaken by both.

Finally, the national bodies above and international institutions need to motivate pilot projects or case studies in order to recover the fundamental aspects of non-formal and formal forms of technological education as well as distance education projects. In these projects the "tecnologias apropriadas" could be used as pedagogic instruments for the reunion of theory and practice. For instance, in the Ceará state, it was developed, by the community, simple technologies for the production of sweets made of typical fruits. This development involved both the theoretical and the practical knowledge of the women involved in the work process. These could be, among others, some strategies that could overcome, in a long-term basis, the difficulties already discussed in this paper.

Technical and Vocational Education for Rural Development: The Case of India

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INTRODUCTION

India is one of the oldest civilization with a rich cultural heritage. About 65 per cent of its total population lives in rural areas. Education is an integral part of the country's development process and this has always been accorded high priority. Universalisation of elementary education, equalisation of educational opportunities in rural and urban areas, women's education, vocationalisation of education, modernisation of technical education, improvement of quality content and process of education at all levels are some of the themes of national importance in the field of education.

Present Trends in Rural Development

Rural development has been one of the key concerns of the country since independence in 1947. The major objective is poverty alleviation through wage employment and credit-linked self employment packages. In the recent past, several new initiatives, approaches and programmes have been devised to deal with mass poverty and unemployment. Some of these initiatives were taken in the backdrop of climate building already achieved by the historic 73rd Constitutional Amendment Act of 1992 which aims at imparting defacto powers to *Panchayati Raj* Institutions and to ensure genuine decentralisation upto the level of Village *Panchayats*.

The outlay of the Ministry of Rural Development, Government of India has increased from US $900 m in 1992-93 to US $2200 m in 1994-95. The enhanced outlay reflect the concern of the Government to insulate the rural poor from the possible adverse spin off as a result of exposure to market forces in the course of the processes of economic liberalisation and structural adjustment. Under the wage employment and infrastructure development programmes, there are several schemes which are being run in the name of *Jawahar Rozgar Yojna*, Millions Well Scheme, *Indira*

Awas Yojana, Employment Assurance Scheme, Rural Housing, Rural Roads and Member of Parliament Local Area Development Scheme. Similarly, under self employment and income generation programmes there are many schemes. Some of the important ones include Integrated Rural Development Programme (IRDP), Institutional Finance for IRDP, Development of Women and Children in Rural Areas (DWCRA), Training of Rural Youth for Self Employment (TRYSEM) and Supply of Improved Tool Kits to Rural Artisans. In addition, there are schemes for special area programmes, rural water supply and sanitation, land reforms, agriculture marketing and special components for women.

Role of TVET in Rural Development

TVET is essential for development of skilled human resource. So far, TVET has played subdued role in rural development because of the low educational status of rural population. However, the TRYSEM programme which is an important training programme for inducting rural youth to viable self or wage employment ventures has been revamped. It is now provided in recognized institutions like Industrial Training Institutions, Farm Science Centres, Polytechnics, etc.

In addition, there are several other organizations and agencies which organize short and long duration training programmes for upgrading the skills. Some of these agencies are:

- Non-Government Organizations;
- Schools in rural areas offering vocational courses;
- State Government Departments like Agriculture, Horticulture, Sericulture, Animal Husbandry and Dairying, Fisheries, Social Welfare, Health and Family Welfare, etc;
- Other Institutions of Indian Council of Agricultural Research and Directorate of Extension Education of State Agriculture Universities;
- Product-wise Boards such as Coffee, Tea, Cashewnut, Horticulture, etc;
- Khadi and Village Industries Commission (KVIC).

In rural areas, the needs are diverse as in urban areas. At the same time, work in these areas are becoming increasingly uncertain and unpredictable due to rapid changes in technology. This has been further accentuated by the new economic and industrial reforms such as restructuring, privatisation, globalisation of trade, redeployment of

workers, etc. The emergence of new technologies and rural industries will require multi-skills to promote productivity of enterprises and to enhancing the mobility and employment security of the person. Hence the role of TVET will become more and more important in the years to come.

TVET Delivery Patterns

Vocational Aspects in General Education Curricula

Vocational aspects are provided right from the primary stage (Classes I-V) to develop awareness in the child about the world of work through visits to service situations or through participation in productive work (Fig.1). The attitudes, values and habits of work are achieved through well organized, self-expressive service and production oriented activities. The children, at the upper primary stage (Classes VI-VIII), become sufficiently mature to carry out strenuous work with advanced skills, therefore, they are encouraged to participate more intensively in production processes by undertaking well designed projects in selected areas of human need. High school stage (Class IX-X) is regarded as a linear extension of the upper primary stage in respect of aims and goals. At this stage, pre-vocational orientation is clearly perceived as part of the general education for imparting simple marketable skills to the students.

Funds are given by the Ministry of Human Resource Development, Government of India to selected schools through state governments to run pre-vocational education courses. Each school is required to offer 3-4 courses for about 20 percent of the total school time. The PVE becomes important in view of large percentage of drop out (80%)by this stage in rural areas.

Vocational Education in General Education Institutions

Vocational Education Programme (VEP) was started in 1976-77 in general education institutions. Under the programme a variety of occupation specific vocational courses of two years duration, to meet the requirements of mainly the unorganized sector, are offered at the +2 stage of 10+2+3 pattern of education. The adoption of the National Policy on Education (1986), its Programme of Action and the Centrally Sponsored Scheme of Vocationalization of Secondary Education that

followed, led to the nation-wide coverage of Vocational Education in both urban and rural areas and the programme is catering to around 1 million students. The Central Institute of Vocational Education located at Bhopal provides R & D support at the national level to the pre-vocational and vocational education programme in general education institutions.

Technical and Vocational Education Provided by Specialized TVET Institutions

There are three different types of specialized TVET institutions in the country. These are:

- Industrial Training Institutions (ITIs);
- Polytechnics;
- Vocational Education Institutes.

Industrial Training Institutes

The Directorate General of Employment and Training, Ministry of Labour, Government of India is running 2900 ITIs throughout the country, both in Government and private sectors to ensure regular supply of skilled manpower at different levels in industries. These ITIs offer 42 engineering and 22 non-engineering trades. The duration of the course varies from 1 to 2 years for all engineering trades but is one year for all non-engineering trades. Total enrolment capacity of these institutions is about 0.4 million students.

The Central Apprenticeship Council (CAC) and National Council of Vocational Training (NCVT) are the two important advisory bodies responsible for laying down the policies, training standards, trade testing and certification.

Polytechnics

Polytechnic graduates form a vital link between professional engineers and skilled workers. There are more than 600 polytechnics in the country with enrolment capacities of about 80,000 students. The technical education system is being revamped with the assistance of the World Bank.

Polytechnics are widely spread in states and union territories and are

affiliated to State Boards of Technical Education which lay down levels and standards of the courses and are responsible for evaluation of polytechnics. The courses are normally of three years duration where full-time institutional instructions are offered but three and a half to four years duration of courses are also offered, where instruction is on sandwich pattern or part-time basis. A large number of polytechnics are located at the district level, but community polytechnics located in some of them meet TVET needs of rural areas.

Vocational Education Institutions (VEIs)

Haryana is the only state where vocational courses have been introduced in specially established vocational Education Institutions. The nature and content of courses is similar to that offered in +2 general education institutions. The overall vocational education enrolment is better in these institutions as compared to general education institutions. The Government of India is planning to have more such institutions in the country.

Non-Formal Vocational Skills Training

The concept of vocational skills training is an old family tradition in India. Even today, a large number of artisans are trained by the elders of the family to carry on the family vocation. While such traditional skills are being promoted on one hand, on the other hand, technological invasion is weaning away the artisan's children from adopting family trades/skills. Some of the important non-formal delivery patterns introduced in the last twenty years are discussed below.

Training of Rural Youth for Self Employment (TRYSEM)

The programme is in vogue since 1979. Its main thrust is on equipping rural youth in the age group of 18-35 years with marketable skills and technology to take up vocations of self employment in agriculture and allied activities, industry, services and business. The other objectives of this programme are:

- to achieve an overall socio-economic improvement in the rural areas;
- to provide modern facilities and technical know-how in order to increase the production and per capita income.

On an average, 3,00,000 rural youths are trained every year. On completion of training, the TRYSEM beneficiaries are assisted under the IRDP.

Farm Science Centre (Krishi Vigyan Kendra)

The Indian Council of Agricultural Research, Ministry of Agriculture, Government of India has established 261 *Krishi Vigyan Kendras* (KVKs) in the last 22 years. The aim of the KVKs is to impart vocational and skill oriented training to the farmers, farm women, rural youths and field level functionaries. These centres are the grass roots level vocational institutions, designed for bridging the gap between the available technologies and their application for increased production. These are run by State Agriculture Universities, ICAR Institutions and NGOs.

KVKs organize around 11,500 training courses every year of different durations in which 3,20,000 trainees consisting of farmers, farm women and rural youth, are benefitted. In addition, many more programmes like Farmers meetings, Field days, Film shows, Exhibitions, Farmers Fairs are also organized.

Community Polytechnics

The scheme of Community Polytechnics (CPs) was started in 1978-79. It envisages the CPs to act as focal points for Science and Technology (S&T) applications in Rural Areas and generate self and wage employment opportunities through non-formal training in over 100 identified technical and vocational trades. The training is geared to the needs of the unemployed/under employed, youth, school and college dropouts, the under privileged and disadvantaged groups including minorities. The scheme has provision for setting up Centres for Development of Rural Technology (CDRTs) meant for development, modification and adaptation of low cost technology relevant to the rural needs. There are at present 375 CPs and 31 CDRTs all over the country. Each CP receives non-recurring grant of US $50,000 and recurring grant of US $25,000, besides US $ 15,000 as seed money (revolving fund) under the scheme. Similarly, CDRT also receives non-recurring and recurring grants of US $50000 and $15,000, respectively.
Four Regional Technical Teachers Training Institutes at Bhopal, Calcutta, Chandigarh and Madras act as Resource Institutes for successful implementation of the scheme through academic, managerial, pedagogical

and S&T guidance as well as by way of arranging training for trainers.

Non-Government Organizations (NGOs)

A large number of NGOs have taken up the work of training of rural youths, school dropouts, special groups, women and even adults in local-specific and need based areas. The duration of training varies from one week to one year. Funding to the NGOs is largely provided by the Council for Advancement of Peoples Action and Rural Technology (CAPART) which is registered under the Societies Registration Act (1860). Funds are available to NGOs under the following six schemes:

- Promotion of Voluntary Action in Rural Development;
- Development of Women and Children in Rural Areas (DWCRA);
- Accelerated Rural Water Supply Programmes (ARWSP);
- Central Rural Sanitation Programme (CRSP);
- Integrated Rural Development Programme(IRDP);
- Advancement of Rural Technology Scheme (ARTS).

CAPART sanctioned 7,375 projects of training and development worth US $41 million upto 30 June, 1992.

Vocational Training through Distance Learning

The open learning system in the country is in the state of infancy and it has done very little for the VEP. National Open School (NOS), started in 1979,is complementing the formal education system at school level. NOS offers modular vocational courses through several accredited institutions (study centres) all over the country. NOS has stipulated that the study centres should have partnering institutions to provide face to face component, which is essential for skill development. At university level, Indira Gandhi National Open University has introduced a few market friendly job-oriented courses. The open education system can play an important role in extending VE to a large population in a cost effective manner. It can simultaneously provide a ladder for continuous education for lifelong learning experiences.

Case studies

Following two case studies are examples of successful implementation of VE programme in an efficient and cost-effective manner:

i. *Vigyan Ashram*

It is a non-government organization located in a remote rural area of Pune District. The main objective of the organization is to bring rural development through TVET intervention. It is successfully imparting training to rural youths through semi-commercial operations for the last 10 years.

The organization is providing training in construction, fabrication, poultry, dairy, water prospecting and testing of blood and urine. In addition, it is also running several other units wherein training for short duration is provided.

In the last 10 years the organization has perfected its technology and several rural youths who have undergone training in the *Ashram* have established their own enterprises. To experiment its rural technology syllabus,it has selected 3 schools where the facilities were created and secondary school students were trained through the same concept of semi commercial units. The schools in the last 6-7 years have earned enough for themselves by rendering services to the community.

The rural technology course of the *Ashram* is recognized as one of the pre-vocational courses of the Board of Secondary Education, Maharashtra, India.

ii. Don Bosco Self Employment Research Institute (DBSERI)

The institute located in Howrah, Caltutta formally started its operation in 1990. It is now recognized as reputed Non-formal training centre for school dropouts. The basic principles and philosophies which guide the functioning of the Institute includes:

- a development project for the socially and economically backward people of the society;

- an opportunity for the underprivileged school dropouts to earn an honest living;

- an answer to the economic problems of the poor through income generating;

- establishment of ancillaries to industries to cut down the cost of production and create employment;

- a scheme to benefit the physically handicapped.

The Institute is running the following non-formal courses of 3 months to 1 year duration with an average strength of 15-20 students:

(i) Jute fibre products;
(ii) Wool knitting/woolen garment making;
(iii) Fabrication of grills, windows and shutters;
(iv) Plastic and nylon moulded material.

Role of the Institute in Self-Employment

The instructors of the Institute keep a close watch on the aptitude of the trainees about the particular job or a line of jobs with proficiency. After completion of the training, the Institute invites the trainees along with the parents/guardians to explain the scheme of self employment with its prospects and implications. Once a trainee is satisfied with the self employment scheme, he or she is asked to join the scheme. The trainee receives bank loan for a project, purchases machines, starts production in the Institute's premises, and sells the products in the market. The money earned in a month is distributed as 40% to the bank for repayment of loan, 25% to the Institute for infrastructure assistance and the balance 35% to take home for living. During these years the Institute observed that the student of an average calibre can repay his total loan in 36 months. This Institute has helped a number of students to establish their own enterprises in a cost-effective manner.

Future Strategies

Industrialization of rural areas, whether it may be agriculture-led or industry-led, has emerged as a major thrust area of rural development. This requires altogether different approach in manpower planning to develop skilled work force which has a different perception to work in relation to mechanisation and competition.

The country has always promoted small-scale cottage industry to generate economic viability in rural areas through various financing schemes and concessions. Since these industries are labour intensive and their growth

and development depends mainly on the upgradation of technology and supply of well trained manpower, their progress has been slow due to lack of these components. TVET can play an important role in fulfilling the needs of these units by developing and upgrading skills of trained manpower. Improvements in service sector in rural areas can also be brought about by developing suitable human resource which are trained in various service related advanced technology.

Intensification of VE in academic stream

It is envisaged that in the next century, the country will have a high rural literacy level due to special focus on "Education for All" and "Total Literacy Campaign". This would also demand a greater role of TVET to supplement the enhancement of socio-economic status of rural people. The number of secondary schools in rural areas has increased as there were 48,262 schools out of the total 86,139 in 1993. Similarly, in the same year, there were 11,642 higher secondary schools in rural areas out of 23,524 in the country. This increase will continue in subsequent years because of efforts made on universalisation of elementary education. The access of TVET system in general education in rural areas is, however, very poor. Therefore, there is a need to introduce vocational components in the form of pre-vocational and vocational courses in all secondary and higher secondary schools, respectively.

Establishment of Block Level Vocational Education and Training Institutes (BLVETI)

In order to check the migration of youth from rural to urban areas and to engage them in gainful occupation, there is a need to establish an independent set up in the form of BLVETIs. This would provide formal and non-formal TVE programmes of short and long durations to girls and boys. The non-formal courses will include week-end, tailor-made and sandwich courses.

Strengthening of Rural Schools

Schools in rural areas are generally poorly equipped in terms of laboratories, classrooms, workshops, farms, etc. Therefore, strengthening of the rural institutions is required to effectively implement TVET programme. It is particularly more desirable due to the absence of collaborating institutions and on-the-job training facilities in the

surrounding areas.

Creation of Hostel Facilities for Girls

In order to enhance the enrolment of girls in TVET programme, there is a need to create hostel facilities in existing secondary and higher secondary schools and proposed BLVETIs. Creation of such a facility is further justified because of lack of *pucca* roads and poor transport system in rural areas.

Longer duration of Instructions

In view of the lower academic achievements of the students in rural areas, the duration of instruction should be increased to 48 hrs per week. In addition, the schools should have single shift. This will provide intensive practice and facilitate rendering of services to the rural community.

Agriculture as a Compulsory Subject

The high drop out rate in rural students is primarily because of non-relevance of education to their socio-economic environment. Agriculture and allied activities being the major economic activity in rural areas, should form an essential component of the school curriculum. It should be introduced as a compulsory subject from Class VI in all schools of the country.

Establishment of Agro-Industrial Workshops

There has been tremendous growth in the post harvest technology in agriculture which has resulted in the greater use of farm machines. This will require establishment of agro-industrial workshops to meet the needs of the community for repair and maintenance of tools and farm machines. Vocational courses on maintenance and repair of farm machines and tools should, therefore, form an integral part of the VE system.

Balancing Demand and Supply

The selection of vocational courses should be need based and local-specific to avoid the mismatch between the supply and demand of skilled manpower in agriculture and rural industries.

Modular Courses

In rural areas a variety of jobs require a common set of skills (core skills) and intensive experience of specific jobs. Therefore, there is a need for different curriculum designs where 3/4 of the vocational component should be devoted to the core skills and the remaining part to the specific jobs, which will form an elective component. This type of arrangement will provide additional opportunity to the students to equip themselves with necessary skills in a short time. In addition, a large number of courses suitable for rural areas should be made available in modular form facilitating the rural youth to select any number of modules equivalent to required credits for obtaining higher secondary certificate or any other certificate which will eventually result in better income or job. Such an arrangement will also provide an opportunity to students for equipping themselves with multi-skills.

Selection of Motivated Teachers

Teachers' performance is the most crucial input in the field of TVET. In rural areas it is generally difficult to find competent and well-trained teachers due to lack of pre-service training and industries. Therefore, there is a need to induct well-trained and motivated full-time teachers into the TVET system so that the programme may be effectively implemented. To achieve this goal, certain incentives and concessions in terms of financial and service conditions should be provided to the teachers who opt to work in rural areas.

Training of teachers

The R & D institutions like CIVE and other existing training institutions such as TTTIs, ITIs, Polytechnics, KVKs, NGOs should be involved in practical training of trainers. The proposed BLVETIs should coordinate and assume the major role of providing training to the teachers/instructors. The community polytechnics should also be used for providing a variety of short duration skill programmes to trainers.

Establishment of Production-cum-Training Centres

The vocational competence and motivation of students can be enhanced to a great extent by running a semi-commercial unit or Production-cum-Training Centre (PTC) relevant to the vocation in the school itself. The

setting up of PTC will allow the teachers and students to get a feel of the parameters that govern the profitability and make possible on-the-job and apprenticeship training in rural areas. It will also generate the resources for the institutes by working for the community and enabling them to become self-sustained.

Evaluation of Skill Competencies

The existing examination system does not have the mechanism for evaluation of skill competencies and personality traits being inculcated among the students. There is a need to evolve a system wherein evaluation of skill competencies is given more emphasis.

Optimum Utilisation of Facilities

The unit training cost of vocational courses is very high. Therefore, the same should be contained by maximising enrolment, ensuring completion rates, maximising infrastructure utility by introducing a variety of courses for different target groups and increasing the working hours of the institutions.

Scholarships to Vulnerable Groups

A large population in rural area lives below poverty line and cannot afford to join TVET system. Therefore, there is a need to provide financial support through scholarships/stipend/loan assistance for studies.

Textbooks on Nominal Cost

TVET books are costlier than the general textbooks. The TVET books therefore should be made available free of cost or on nominal cost to the students in rural areas.

Preference for Loans

The TVET input provided to the students become irrelevant in absence of financial support from any source to start their own enterprise. The vocational trainees should, therefore, be given preference in the form of (a) loan assistance at par with graduates or diploma holders; (b) a free tool kit, wherever required; and (c) exemption from seed money.

Coordination and Monitoring

Due to lack of proper coordination between different agencies implementing TVET programmes in rural areas, the output is diffused. This calls for an agency which undertakes coordination and monitoring of the programmes. The proposed BLVETI when established can act as a nodal agency, till then one of the three institutions involved in TVET indicated above should be entrusted with this responsibility.

Conclusion

The role of TVET is critical in the rural development as it has enormous potential in developing human resource for usage and transfer of innovative technologies at the grassroots level. TVET should address the issues such as pressure due UEE and TLC, poor infrastructure, survival of the rural youth in the market economy, drop out problems and low participation of industry in education. Improvement in TVET system, especially in rural areas, would call for comprehensive multi-faceted strategies and coordination and monitoring mechanisms. International agencies should bring into focus the reasons for gaps between HRD indices of rural and urban life. The agenda for the new century should be implication of HRD indices in the process of globalisation of economy and industry.

Technical and Vocational Education for Rural Development: The Case of Kenya

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INTRODUCTION

Over the past three decades, Kenya has experienced a relatively steady growth in the provision of education, health and several other essential services for her people. This has largely been due to the absence of political instability and continued financial support from the international community.

This growth has precipitated one of the highest population growth rates in the world (4% in the 80s), and tremendous growth in the education sector. By the year 2,000, Kenya's population is estimated to reach 35 million, 78 per cent more than that of 1984. The population will include a work force of 14 million which will necessitate a doubling of jobs in Kenya (Kenya, 1986 p.1), urban population is also anticipated to reach 9 to 10 million, 26-29 per cent of the population by the year 2,000 compared to only 15 per cent of the population in 1984 (Kenya, 1986 p.41).

Education has expanded tremendously at all levels due to the government's efforts and the parents' determination to provide increased educational opportunities to young Kenyans. Currently, about one million children attend public and private nursery schools and about six million attending 15,000 primary schools in the country. There are about 650,000 students attending over 2,700 secondary schools. University education has also grown up and over 40,000 students enroled in the five public universities.

This growth has exerted increasing pressure on available resources in all sectors of the Kenyan economy leading to shortages of essential goods and services and rising levels of unemployment amongst the youth for most of whom primary level education has been terminal.

It was discovered as early as the 1970s that youth unemployment was on the increase because the formal employment sector was not absorbing the increasing labour force entrants due to limited capacity and in some cases because the new entrants did not have the right skills in demand.

This occurred at a time when various cadres of manpower especially those in the lower and middle level groups such as craftsmen and technicians were in high demand.

The growing population still lacked adequate supply of basic needs such as food, shelter, clothing and health facilities and services which needed skilled manpower to provide. The increasing numbers of unemployed youths found their way into the informal sector which grew rapidly from the 1960s (ILO, 1972) and currently estimated to absorb 70 per cent of the entire workforce. This is expected to remain so into the future.

In 1985, the Kenyan government re-examined its national development policy in light of the increased demand on available resources and rising unemployment among the youth. In Sessional Paper No. 1 of 1986, the government policy framework adapted identified a set of goals and strategies that would guide the nation into the dawn of the 21st Century (Kenya, 1986).

The goals for renewed economic development policy included:

- Renewed economic growth with a target rate of 5.6 per cent for GDP from 1984 to 2,000;
- Accelerated employment creation especially in the private sector;
- Rising productivity in all parts of the economy;
- Provision of basic needs for all Kenyans;
- Food security;
- Improved rural-urban balance; and
- Gradual structural change from an agrarian into an urban-based industrial economy.

Amongst the most important strategies outlined in achieving the above goals are education and training. It was pointed out for example that employment in the government sector will no longer be guaranteed for university graduates and those from various training programmes. Thus as the numbers hired in government services decrease so will the training in government institutions. The cost of education and training will

gradually shift to the beneficiaries and that such training will re-orient the curricula to the needs of the private sector (Kenya 1986 p.107).

Present Trends in Rural Development

The Kenya government's development strategy has a rural focus where the district, a smaller division in the administrative structure, has the authority to determine what project should be implemented in a given five year plan period. The country is divided into eight provinces which are in turn sub-divided into about fifty districts.

Development plans are usually drawn by district departmental heads of ministries under the co-ordination of the District Commissioner with wide representation from communities and local authorities (Kenya, 1989).

There are socio-cultural plans and economic plans containing policy guidelines and priority areas mainly oriented toward rural development.

The socio-cultural plans are mainly centred around five major areas: social service, community development, education and training and health services. Project and programme priorities in the district plans in this area focus on:

- the provision of assistance to women's groups to increase their participation in community development;
- the assistance to growth development activities including youth polytechnics and other vocational training institutes;
- support for disadvantaged groups such as the disabled and destitute children;
- support for the expansion of both primary and secondary school education and;
- the provision of primary health care.

Government plans as reflected in the District Development Plans also reflect a rural focus. Project and programme priorities in this area are mainly focused on:

- improved food and cash crop production;
- education development (qualitative and quantitative);
- expansion of infrastructure;
- market centres and small towns development; and,
- expansion of manufacturing and service sectors.

A recent study into the socio-cultural and economic contents of cross-section of Kenya's districts (Kerre, 1993) revealed several noteworthy trends:

- Rural-urban migration continues underrated so long as rural areas lack basic infrastructure and employment opportunities and that industrialization is concentrated in urban areas;

- Contrary to traditional beliefs, a significant number of households are currently headed by women most specially in densely populated areas and that most women are rapidly shifting their activities from purely social-welfare to income-generating activities;

- The attitude of the general public is changing positively towards the informal sector where the majority of the more than 500,000 new labour market entrants are accommodated;

- Most districts including those without suitable climate conditions have agro-based economies and are mainly constrained by the lack of adequate infrastructure including roads, electricity and water;

- There is a conspicuous lack of large scale and medium social industries in the districts;

- Most districts have identified their potential development needs and constraints. However, these priorities are most often unmet due to over-dependence on government grants and donor aid which have lately been scarce to get;

- The Jua Kali (Informal Sector) which now takes the lion's share in the provision of employment opportunities needs more support with training and resources to start up or expand on existing businesses.

The Role of TVET in Rural Development

The government and the public at large have recognized the important role that technical and vocational education and training can play in development. In Kenya, youth polytechnics (YP) are the major institutions currently targeting the primary school leavers who average 250,000 each year, about 70% of primary school leavers who do not pursue secondary education.

The history of Youth Polytechnic training in Kenya goes back to the mid 1960s when the National Council of Christian Churches (NCC, 1960) raised the concern for primary school leavers. The Village Polytechnic Programme, as it was called then, was launched in 1968 in Central Province and Western Kenya. The primary goal of Village Polytechnics was to provide vocational training for the youth in rural areas. The institutions were mainly community initiated and supported under Kenya's popular self-help spirit (Harambee).

In 1988 the report of the Presidential Working Party on Education and Manpower Training for the next Decade and Beyond (Kenya, 1988) further re-examined the question of training and recommended that:

- vocational training institutions include in their curriculum the teaching of entrepreneurship skills;

- graduates of vocational training institutions be assisted through a formalized credit system to establish themselves in self-employment and preferably on a co-operative basis;

- in an effort to implement the policy guidelines for renewed economic growth, the government supported the development of a strong vocational training network co-ordinated by a government ministry.

Subsequently, the Ministry of Research, Technical Training and Technology was established in 1988 to co-ordinate vocational training as well as the development of the Jua Kali (Informal) sector. Generally, vocational training and various informal sector activities targeted at increasing opportunities for youth employment have had considerable support from the government, both local and foreign donor agencies and particularly the World Bank, International Labour Office (ILO) and the United Nations Development Programme (UNDP).

TVET Delivery Patterns in Kenya

In Kenya tvet is delivered through three major delivery systems: the formal, non-formal and informal systems.

The Formal Tvet System

In the formal system two major delivery patterns are evident: one is the introduction of technical and vocational education in the school curriculum at both primary and secondary school levels (Kenya, 1985). At primary level, tvet subjects are: agriculture, art, art and craft, business education, home science and music. At the secondary schools level the tvet subjects are: agriculture, art and design, drawing and design, business education, building construction, electricity/electronics, metalwork power mechanics and woodwork. In this case, technical and vocational education is the responsibility of the Ministry of Education.

The second delivery pattern in the formal system is the post school institutions. These include:

- around 650 youth polytechnics, catering for over 40,000 students most of whom are primary school leavers;

- 17 technical training institutes and 21 institutes of technology with a population of about 10,000 students mainly secondary school graduates and offering craft and technician programmes.

- three national polytechnics with slightly over 10,000 students mostly secondary and higher level students and offering diploma certificate in various technical disciplines;

- several vocational training institutions attached to government ministries and parastatal organisations offering a wide range of programmes from artisan to diploma levels.

The non-formal TVET system

Besides the formal tvet system, Kenya has nonformal network of tvet institutions run by Non-Governmental Organisations, churches and individual proprietors. They offer various courses such as tailoring, bakery, metal fabrication etc. to specific target groups such as women

groups, girls, street children, the handicapped etc.

The Informal TVET system

Recently, much interest has been expressed by individuals and community groups who seek to participate in income generating activities in the informal sector. A major activity in this area has been the apprenticeships taken by youth with experienced artisans in various trades. Community groups and individuals have also been targets for support of NGOs in acquiring specific skills to operate small enterprises.

Various government departments and institutions of higher learning also actively participate by offering short course in skill upgrading, farming and health care to: artisans, farmers, women groups, etc.

At this moment, Kenya does not have tvet programmes through long distance learning.

Challenges to TVET in Kenya

Kenya, like most of the other African countries in Africa, faces major challenges in the development and implementation of tvet. These include: economic decline, declining enrolments, lack of trained teachers and trainers, low status syndrome and more recently, the changing needs of society and the work place (Kerre, 1995).

A major concern has been the fear expressed by the critics of tvet that the programmes are still traditional in content and at most irrelevant to modern societal needs. It has been observed for example that youth polytechnics no longer address and fulfil the needs and demands of the communities in which they are set. There is a lot of duplication of courses even in communities where they are of no immediate use.

Despite the fact that women are numerically balanced in the general population and enrolment in tvet, they are still largely found in stereotyped courses such as dress making, home economics, hair-dressing e.t.c.

The lower status still ascribed to tvet and the high cost associated with tvet programmes have pushed enrolments towards service oriented theoretical programmes. It is cheaper to mount training courses in

accounts and secretarial studies than putting up workshops and equipping them for technical subjects.

The heterogeneity of the informal sector is a major constraint as shown by Guerrero in Latin America (Guerrero, 1989 p.159). The concept gives rise to different interpretations and hence the difficulty in estimating its potential for training and employment opportunities.

In Kenya, Walsh (1992) observed that while an enabling environment exists for critical evaluation of education and training for the informal sector, the training needs and capabilities of potential informal sector clients have not been determined.

Successful Innovations

National Policy Frameworks have been introduced to promote tvet and the development of the informal sector. Of particular interest have been the introduction of entrepreneurship education in all tvet programmes and the availability of credit facilities to potential entrepreneurs to start up or improve on their businesses. Today, more youth are looking forward to and getting into self employment rather than looking around for salaried employment.

Another notable innovation has been the introduction of production units in most vocational training institutions (VTIS). With declining government financial support, several institutions are offering products and services needed in the immediate environment. Such production units as furniture production, metal fabrication, bakery, water pump production, farming, horticulture etc. are a common find.

Collaboration between technological institutions and the Jua Kali sector has been encouraged. Several hundreds of artisans in this sector have benefited from short courses and workshops conducted at the Jomo Kenyatta University of Agriculture and Technology, Egerton University and Eldoret Polytechnic amongst others.

Further Strategies

Kenya as a young developing nation without an established sound industrial base is aware of its vulnerability in the economic liberalisation movement. The industrial base that has already taken root particularly

in the informal sector has full government backing and has some measure of protection through the imposition of taxes on imports.

A more acclaimed strategy is the introduction of entrepreneurial education in tvet programmes and the creation of various credit facilities through banks and other financial institutions to enable entrepreneurs operate their enterprises successfully.

Concerted efforts between the government and a host of Non-Governmental Organisations have been directed toward community extension training programmes for farmers, women groups and youth in agriculture, horticulture, crafts, metalwork, furniture production and tailoring amongst others.

There is a major World Bank project aimed at the training in the Jua Kali (Informal sector) artisans to upgrade the technical skills and also acquire business management skills. As industrial activity picks up in both formal and informal sectors, there is a trend toward a demand - derived vocational training strategy for tvet in Kenya.

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Technical and Vocational Education for Rural Development: The Case of the Republic of Korea

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INTRODUCTION

It is a general trend of a developing country that mobilization of workforce arises across different industry sectors as the nation's industrial structure undergoes various changes along with scientific technology development and economic growth.

Korea is no exception. Korea has achieved industrialization successfully since 1970s as a model of an export-driven manufacturing country and, in turn, of a high economic growth achiever. As the result, however, the industrial structure has been remodelled, especially showing a drastic cutdown of workforce in the agriculture sector. The population of rural districts has decreased by the rate of 2.7% annually during 1970-1990, while the urban population has increased by the rate of 4.7% during the same period.

Korean agriculture faces difficulties especially in production line due to decrease of workforce size, aging, and overwhelming workwomen. These phenomena become major threats to the traditional agrarian society and rural development. Furthermore, the advent of WTO forces Korean society to open its market to the world. And in the long run, the first industrial sector will face crises which can be said of a life-or-death question for the nation since it does not have strong competitive edges towards the world markets.

If there is no drastic changes in the agricultural production line, it is easy to expect that farmers drainage will greatly increase due to deficits in farming. Currently, domestic agricultural prices are far higher than those in the international trade. Farmers leave their farm lands giving up their traditional callings, which will influence over the Korean economic development as a whole and over the rural agricultural economy as well. Thus Korean society is facing fearful situations under which rural and

agricultural development are dearly required.

Size of cultivated lands

Though the total number of farm households has gradually decreased, the size of cultivated lands has not relatively expanded. Because non-farmers have purchased cultivated lands as an acquisition of their property (as of 1992, the percentage of cultivated lands owned by non-farmers is 22.4%), cultivated lands of farmers have not expanded actually. In 1992, the average size of cultivated lands per farm household was 1.2 hectare. This size is much smaller in comparison with those of advanced agricultural countries. Besides, both scantiness (40-pyung on the average) of lot-unit of land and scattered-type of lots make it hard to cultivate lands on the large-scale base. Major factors that brought out scantiness of the size of cultivated lands were high price for purchasing farmlands, trend of refusal to purchase farmlands caused by a sudden rise of the land-price, and rising of production cost due to high rate of rent for farmlands since 1990s.

Structure of agricultural production

Current structure of agricultural production is concentrated on the production of major food grain such as rice. Accordingly, it is more likely to suffer from 'the Open-Economy Policy'. At present, the degree of self-supply of food grain is barely 34%. The degree of self-supply of foodstuffs except rice and barley is 9% at most. Domestic production-bases for wheat and maize are collapsed and those for bean are almost in similar situation. Also, most other products are loosing competitiveness because of high production costs.

Income of farm households

Unit of agricultural management in Korean farm households is very scanty. The portion of revenues from non-agricultural income is relatively small. Therefore, income of farm household is relatively lower than that of urban counterparts.

Living expenses of farm households

The average amount of living expenses per farm household is 10,046 thousand won (approximately 12,600 U.S. dollars) in 1992. Among the

living expenses, the cost for housing and for the fuel, light and water show relatively higher rates of increase than previous years due to the extension of 'the House Reconstruction Project' in rural areas.

Educational conditions of agricultural communities

Sharp increase in the number of residents leaving agricultural communities resulted in both drastic decrease in student population and growing increase of closed schools, small-size schools, and multiple-grade classes. At present, student population of elementary and middle school has been decreased almost to half, compared to 10 years ago. In addition, looking into the inner part of rural school system, overall educational facilities including classrooms, heating and air-conditioning equipments, toilets are inferior to those in urban schools.

Deterioration of educational conditions in agricultural communities may cause accumulation of learning deficiency of students and may become a major factor of achievement disparity between rural and urban school students. Achievement disparity between students living in different communities deepens mistrust of residents of agricultural communities on effectiveness of rural school and thereby, incite them to send their children to study in urban schools.

Parents who sent their children to study in urban schools bear much burden of additional educational expenses including lodging fees, traffic expenses. As a result, a farm household invest, on the average, 40% of farming fund in educational expense every year. Also, the composition ratio of educational expense of consumption expenditure of farm households is relatively higher than that of residents in urban areas.

ROLE OF TVET IN RURAL DEVELOPMENT

The developmental changes in agricultural and rural sectors are accelerated through globalization and opening trend of the world markets. First of all, rural areas should be developed in order to enliven the agriculture sector in a drastic changeable circumstance, since agriculture is rooted in the rural areas traditionally and fundamentally. And continuous training of agricultural workforce should be the major target of rural development.

Vocational training or education plays the major role in developing agricultural workforce in a sense that generation of human workforce is possible only through training and education in most cases. Agricultural development is prerequisite to rural development. Vocational training or education is required for all. It is not a simple collection of talented human resources.

TVET DELIVERY PATTERNS

Vocational education in schools

Korean education has a typical 6-3-3-4 ladder system: six years of elementary education, three years of middle schools, three years of high schools, four years of higher learning. For higher learning, students can also enrol for two years college instead of four years university. Elementary schools and middle schools are for general education for which almost all Korean children are enrolling. Students study field subject matters during their elementary school days and technology and industry in middle schools, undertaking the basic part of vocational training.

More professional vocational education are delivered through high schools in various fields.

A practical course in elementary schools

According to the sixth curriculum introduced by the MOE (Ministry of Education in 1992, elementary school students should learn field subject matter at least once a week for three years from the third year to the sixth year. They are expected to understand the real meaning and importance of working and learn how to live together in real society through experiencing quasi-actual working activities.

The objectives of the practical course is to give children the opportunities to enlarge their attributes towards work and to develop basic skills and aptitudes to live up in the real lives. More specifically, it is to help children to deal with working tools and make things needed in every day lives. It is also to help children to cultivate or renovate the charming living conditions properly. Finally, it is to help children to understand the value of work and to keep sincere attitudes for cooperative working.

Technology and industry in middle schools

According to the sixth curriculum reform introduced by the MOE in 1992, middle school students should learn technology and industry for three years; at least one hour a week during the first year and two hours a week for the rest two years of middle school. The subject matter is a comprehensive one including technology, agriculture, manufacturing, commerce, and fishery. All students are expected to study this subject matter, regardless of sex. The educational objectives are to help students to obtain basic knowledge and skills in relation to technology and industry, to understand work side and vocational aspects of technology and industry, and finally to develop adaptable abilities and attitude enough to survive in this competitive world.

Agricultural high schools

Agricultural high schools have played vital roles in educating agricultural workforce and contributed much to rural development. Currently, however, the number of agricultural high schools has decreased to twenty with twenty thousand students in 1994.

The major study areas of an agricultural high school are agriculture, forestry, livestock industry, floriculture, sericulture, agricultural farming, agricultural construction, food processing, farming machinery, living science, landscape architecture, and commercial distribution of agricultural products. Students also learn about core subject matters such as agricultural development, field study on farming, and computers.

The distinctive problem of agricultural high schools is the scarcity of workshop facilities, even though modern automatic learning facilities are sorely needed for better vocational training. On-the-job-training of high school teachers is not as comprehensive, thus, most teachers lack knowledge on modern agriculture and suffer from lower morale. Students also lack the basic academic skills. Low student settlement after graduation to the related areas is problematic also (Table 6). Scarce demands on high school graduates in the labor market and students' high aspirations on college entrance make the situation even worse.

The MOE reshuffled the study areas in agricultural high schools in 1992 with the expectation that reform would change the industrial structure and increase enrolment in high schools. The high school reform was

designed to answer the local needs of agricultural development and to improve the agricultural sector, in anticipation of a drastic change in the whole industry. The characteristics of the reform are as follows: reform of agricultural high schools to agricultural industrial high schools, floriculture or production-centred curriculum management in urban areas, establishment of those study areas such as agricultural machinery/manufacturing food/commercial distribution of agricultural products, and the establishment of study areas related to those specific agricultural products in specific local areas. The government invested 42,000,000,000 won in 1994 to achieve the above-mentioned goals.

Two year agricultural colleges

As of 1994, one national college and thirteen privately owned colleges are open to provide opportunities to 3,600 students to study agricultural professions. Major study areas are floriculture, landscape architecture, livestock, agricultural management and technology, manufacturing of food.

Two year colleges are facing similar difficulties to those of agricultural high schools, such as scarcity of facilities for experiments or field research, low transfer rate of graduates to the agricultural professions, which means improper training of basic workers required for the agricultural development.

Agricultural colleges

There are nineteen national agricultural colleges where 5,395 students are enroled and fourteen privately-owned agricultural colleges with 3,110 enroled students. In addition, five national colleges have agricultural departments along with 350 students and fifteen private colleges have agricultural departments for 1,190 students. Agricultural colleges have contributed little to the industrial development because they are lacking research activities in those ultra-modern high technology and science areas and application researches as well. Most ultra-modern agricultural technologies copied from those developed countries and those industries which are in the secondary industry group such as food processing do not contribute much to the development of that area. Colleges located in rural areas are not fully specialized so that relational vocational education or training can not be accomplished and, in turn, admirable rural development can not be achieved.

Thus, the problems in the agricultural education in those formal education systems are summarized as follows: deficiency in students' understanding on agriculture and lack of workmanship in or poor attitude towards agricultural vocations, shortages of school facilities, and under utilisation of trained workforce.

Farmer Training Programme

Farmer training programmes under the auspice of MOL (Ministry of Labor) are two types: one is hiring enhancement training supported by the agricultural special funds, and the other is a company training organized by the companies in the agricultural industrial parks. Company training programmes are not productive. In 1991, among 6,000 applicants, 1,409 aspirants participated in the programmes.

Employment enhancement training was hosted by the Office of Agricultural-Fishery Improvement from 1990 to 1993. The training was to provide vocational training programmes for the enhancement of hiring local residents, and most participants were aged fourteen to fifty living in local areas, and have had land measuring less than 1 ha. Agricultural-fishery improvement funds continued for four years to train 55,334 local people. The details of the unit cost for the training was as follows as of 1993: registration fee, two thousand won for special family allowance, fifty thousand won for household special allowance, and fifteen thousand won for transportation fee.

The training activities hosted by the Branch were taken over by the provincial governments, and the Ministry of Labor has a plan to provide twelve trillion won of agricultural special funds for ten years' training activities from 1995, in which two hundred thousand people will take part in the training programmes (Table 8). Requirements for enrolment in the training was established. Youth of less than fourteen years' of age from the household with less than one hectare of farming land can enrol the training programmes, and they will be chosen exclusively. The training activities will be performed by the training agencies chosen by MOL. Public vocational training branches in MOL such as twelve technological colleges and twenty eight vocational professional schools, eighty approved vocational training centres, and 867 private academies approved by MOE are the examples.

The training areas are diversified as follows: information processing, office automation, information and electronic communication, beauty industry, nursery, computer design, cooking, heavy transportation facilities, high pressure gas, hot floor instalment, electric and electronic machinery, computer maintenance, interior design, electricity.

Vocational Training

The Office for the Agricultural-Fishery Improvement tries to educate the agricultural workforce distinctively from the foundational workforce to the professional workforce, and finally to the leading workforce

The well-known 4-H is to train youth in the local areas to be productive construction agents by providing new knowledge and technologies to improve their living conditions and opportunities to appreciate the social cooperative life patterns. The activity emphasizes the development of four training values such as knowledge, virtue, labor, physical conditions, and youth aging from thirteen to twenty-nine try to experience every aspect of these four disciplinary values by participating in autonomously organized activities. The activity was reorganized in 1991 to have two functional branches. The branch for agricultural management is to supervise future agricultural leaders by providing them with up-to-date agricultural technologies. The student branch is to engrave students' intentions to live along in agricultural sites. Though the number of activities and participants are decreasing, 105,125 participants are still working in 5,269 activity groups.

Farmer training is to train agricultural professionals enough to fight against the age of limitless competition and to enforce professional technologies needed in each specialization which are required to compete with those fast moving surroundings along with the globalization of and open trends of the markets. The training period is rather short: one to five days. The specified goals are to spiritualize workmanship, enhancement of understanding of changes in agricultural circle and adaptability, and enlarging the understanding of government's agricultural management and expansion of autonomous participation, and improvement of professional and managerial skills. By 1995, 940,000 people took part in this programme.

There are various other training programmes hosted by related organizations such as agricultural cooperatives, fishery cooperatives,

livestock cooperatives, the Corporation for the Development of Agriculture and Fishery, the Corporation for Commercial Distribution of Agricultural Products, and various agricultural products associations. The specific goals of these programmes are to train their own staff members not to train farmers.

Vocational and Technological Training through Distance Education

Air and Correspondence High School and Air University are the major features of Korean distance education. These educational institutes provide those rural residents who do not have proper educational opportunities with vocational education or training, which can work as a prerequisite to vitalizations of rural economy, regardless of their living conditions or time but with greater educational effectiveness.

Agricultural education or training in the current air and correspondence education system is as follows.

Air and Correspondence High School

The school was established to provide those youth who did not enrol for high schools but with middle school diplomas and adults with opportunities to learn the same curricular activities as those in normal high schools.

Air University

Air University is the best but the only one institution for higher learning. The university adopts three different learning/teaching methods; broadcasting and correspondence, self-study, and attendance to the regional study centres of the university.

The number of students enroled in sixteen departments is 196,175 as of 1996. Among them, the number of students in the agricultural department is 8,250, 3.7% of the whole student body. The students who are engaged in agricultural or similar areas is 776. The students who pass the graduation test receive B.A.

FUTURE STRATEGIES

Various vocational education methods are adopted in Korea to cope with worldwide but fast globalization and opening trends and, finally, to improve the economy in rural areas. A brief introduction to vocational development strategies for the betterment of agricultural society is as follows.

Reform of agricultural education system

The basic directions of agricultural school education reforms will be as follows:

First, educational objectives for each school or educational institutions should be clarified and their roles should be defined. Four year colleges should study the higher level of technology and educational professional human resources for that purpose. Two-year colleges should train middle level professional managers for effective agricultural and other related management.

Secondly, vocational training should be specialized to cope with rural development and globalization. Four-year colleges should seek for localization and develop ultra modern technology. High schools should be specialized as product-centred agriculturist training centres emphasizing locality.

Thirdly, the agricultural workforce training should be initiated into the governmental human resources management policy.

More sophisticated reforms in the agricultural education system are expected as follows:

First, specialization of agricultural colleges and the unification of similar departments in those colleges will be fostered to remodel them as centralized vocational education or training centres for the improvement of rural agricultural economy, as scientific technology development centres, or information offices for rural development.

Secondly, agricultural professional schools will be established to train professional managers. Competitive agricultural management emphasizes establishment of outstanding professional schools in which

excellent specialized managers will be trained. In this school, non-formal courses such as training of U-turn workforce, vocational education for farmers, on-the-job training of high school teachers will be added to formal training activities.

Thirdly, some agricultural high schools will be chosen to train self-sustainable agriculturists equipped with professional workmanship which are needed to fight against the competitive globalization. Students will be exempted from all education costs such as entrance fee, tuition fee, school supporting fee, and special funds will be established for their meals.

Special supporting funds are provided to graduates from these schools for their soft landing to agricultural areas. They will be treated favourably or chosen exclusively as farmer successors and industrial functionalists. Educational opportunities in two year colleges and in open universities will be expanded for them. Agricultural two-year colleges and four year universities will select students from rural districts based on extra quotas. Many higher education institutions will select students on special quota bases when graduates from vocational high schools want to study further in the same academic areas: thirty percent of day classes and fifty percents of night classes in normal two-year colleges, twenty to forty percents of day classes and eighty percents of night classes in open universities. In addition, various supports will be prepared for teachers in agricultural areas.

Tasks for vocational training development

The developmental directives for vocational training which Korean government is launching towards the betterment of rural development are as follows:

First, the government has a plan to implement vocational education or training in consideration of those distinctive vocations in specific areas. Current training courses emphasize such areas as information processing, automobile and office automation, which are not directly related to the agricultural development. Furthermore, these areas are not positively related to those areas companies in each industrial park are engaged. Future vocational training will be planned to match directly with those characteristics specific rural society emphasizes. Plans to encourage further employment will support these special efforts and training

performance in related areas will be emphasized further. Participants will be selected based on quotas shown in each training area which would be established in consideration of local characteristics and conditions. In addition, training tours will be considered to diversify the training methods.

Secondly, the government will establish diversified but well-chosen training centres for vocational education. Currently, the management of vocational education is dispersed over several managemental bodies so that proper adjustments and mutual cooperations are not favourably achieved. A committee or cooperative professional organization will be established for general planning and comprehensive management of agricultural workforce training. In addition, education on commission in various educational institutes such as vocational high schools, two year colleges, industrial open colleges are proposed to answer the farmers' diversified training needs.

Thirdly, participating groups in technological vocational education and career education will be expanded further. The government willing to expand the target groups of vocational training and to sophisticate the selection process by lessening enrolment requirements. In addition, counselling and some other supplemental programmes or provisions will be prepared to help those who are suffering from poverty, low salary, long working hours, and low preparation to training activities. Special career placement programmes are positively considered for sound career development and better living of the participants.

Fourth, effective placement of the successful achiever will be sought on an institutional basis. Various plans to dissipate the dropout rate of vocational training participants and to increase the employment of local residents are installed in 1995 by utilizing the special agricultural funds. Local employment encouraging funds, housing funds, and exemption of military services, will be reviewed for the successful implementation of this plan.

Fifthly, better understanding of the agricultural society and acquiring of agricultural technology will be sought through regular and formal school education. Effective training of agricultural leaders need sincere but comprehensive understanding of agriculture and the agrarian society. And the decision to be a farming specialist should be made in schools. Various learning materials should be developed and introduced to help students

learn more about agriculture and agrarian society and better agrarian experiences should be provided from the elementary and secondary education stages. Governmental administration or financial supports are planned to alleviate the educational differentials between urban and rural schools by supplementing school facilities and by providing wider range of fringe benefits to teachers. Exemption of tuition fees and expansion of scholarships for rural students will be positively and exclusively sought for.