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Enhancing Professional Agricultural Education in Development Co-operation - Adaptability of the Dual System in different socio-economic contexts

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1 Introduction

Economic and Technical Co-operation aims at enhancing development by the transfer of technologies for which opportunities exist and which are appropriate with respect to the socio-economic environment. There are basically two ways in which this can be achieved. First, experts and advisors are posted to monitor the process of technological change, normally in the framework of development projects. Secondly, investments in human capital may be implemented through professional training. However sustainability can only be achieved if both approaches are combined and an appropriate system of professional education is being developed.

Unemployment continues to be one of the most serious problems in developing countries. Rising numbers of school leavers having received general education of various standards are seeking jobs in the modern sector, unsuccessfully in most instances. For this reason professional education has for a long time been considered an issue of priority in development Co-operation. In the past decades a great number of professional schools have been promoted in consideration of the fact that investments in human capital formation are a precondition for capital investments. However, while most rural development projects comprise a training component, this is all too often of rather little impact. Quite frequently, measures of long duration training are implemented during project operations or have little relevance to the project purpose.

Most Third World countries lack profound and efficient systems of vocational education which can meet the challenges of rapid technological development and socio-economic change. Consequently, opportunities for appropriate vocational training are absent and school leavers face but slim chances of finding adequate employment. It remains a Government's obligation to intervene, in spite of the current trend of deregulation and principles of minimum public interference.

The German system of vocational education, normally referred to as the Dual System, has recently attracted many Third World Governments as a guideline for the improve-

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ment of professional education.[1] The term Dual System of Professional Education refers to a concept where the responsibility for training and teaching is shared by the private sector and the state, i.e. by individual enterprises and state schools. Central element of the system is practical training in the firm, which initially amounted to up to 90 % in Germany. However, the involvement of public institutions has gradually been increased, and amounts to about 50 % today. In many Third World countries, on the other hand, the development of professional education commenced with the establishment of Technical Schools which have put mayor emphasis on theoretical instruction. The corresponding element of practical training for trainees as well as for trainers is insufficient and, consequently, has to be enhanced.

This paper intends to assess activities of the German Institute for Tropical and Subtropical Agriculture (DITSL) for the assistance of Third World countries in implementing an improved system of professional education based on the German experience.

2 Brief history of the dual system of professional education in Germany

2.1 Professional Education in Crafts and Industries

In the Middle Ages training of apprentices by master artisans was organised by the guilds. The first regulations known, where apprenticeship was mentioned, are those laid down by the woodcrafts (Drechsler) guild of Cologne in 1182 a.D. Education did not only involve training for the skills of the art, but comprised a comprehensive moulding of the personality of the young men. Apprentices lived in the families of their masters as "honourable sons" until they were formally called free. This ceremony could be performed after a period of eight years or more (RÖHR, 1991).

In the late Middle Ages the guilds lost their powerful position in the urban societies. and were abandoned in 1806. The apprenticeship system had deteriorated, but training on a less formal basis continued. When the industrial revolution began, manufacturers were still able to recruit skilled personnel from the artisans. However, availability could soon not be matched by the demand, and in the late 19th century many companies started to train their own personnel.

The Prussian Trade Regulation Act (Preußische Gewerbeordnung) of 1845 which became general law for the German Empire after 1871, had initiated a revival of the apprenticeship system. During the period of rapid industrialisation company owners became increasingly aware that challenges of technological development could not be met, if patterns and principles of early capitalism continued to be applied for labour

[1] Internationally, systems of professional education differ considerably with respect to the involvement of the Government. In France, e.g. initial training is entirely conducted in state institutions. In Japan, on the other hand, this function is exclusively left to the enterprises.

recruitment. Likewise, labour representatives realised that a continuous improvement of skills among their clientele would increase the bargaining power of the working class. Hence, both parties together with the respective Government institutions co-operated in developing an appropriate system of vocational education in the subsequent decades. In 1908 regulations for a generally recognised trainer's certificate were introduced.

In the 19th Century Germany was a developing country by means of criteria accepted today. Apart from the creation of new sources of finance, like co-operative banks, development of the dual system of professional training was a corner stone for industrialisation. However, progress was achieved through the promotion of crafts rather than by hindering their development. In 1897 Chambers of Commerce and Industries had been established in Prussia. In due course they were given legal status for the entire German Empire. As associations of private entrepreneurs with compulsory membership they were assigned tasks of public interest. These comprised the right, as well as the duty to regulate professional training and establish relevant institutions. The respective legal framework was constantly adjusted through the 1920's as well as after 1950. Likewise, Chambers of Agriculture were assigned the task of regulating professional education in their field.

At the end of the 19th century professional training courses were held as Sunday or evening schools. Arithmetic's and writing was taught by school teachers and experienced artisans. Later, teaching was done on a half week day. In 1911, and later in the 1920's legislation for the conduct of technical schools was formulated. In 1927 they were officially named "Berufsschule" (Professional School) and full time teachers were employed. Compulsory attendance up to the age of 18 was institutionalised. Later in 1938 mayor amendments and specifications to the legal framework were made. The present system is ruled by the Vocational Training Act (Berufsschulgesetz) of 1969, which contains uniform regulations for all forms of training (HALBACH et al., 1994). Hence, although development of the modern system of professional education commenced at the end of the 19th century, it took a long time to become fully operational. Nevertheless, after the Second World War it was fully functional and had gained general acceptance as a strong element of the educational system. Reconstruction was accelerated through the availability of a highly qualified labour force.

Over a period of about 100 years a system of professional training had been moulded which was able to play a key role in the economy. Its most important output, i.e. the qualified labourer proved to be a major asset of the economy. It had been developed in order to enhance technological change and it has served this purpose effectively. However today, structural changes in the industrial sector have yielded some constraints. The evolved class system of competent and self-confident professionals tends to be too static to foster the creation of new professions constantly required in the light of modern rapidly changing technologies. However, it has to be realised that this applies mainly to training in the industrial sector. Here, training always tended to be orientated to the needs of the individual company. In addition, and more seriously, job profiles were

constantly simplified for the sake of productivity (STEPHAN, 1996). The sector of medium sized crafts enterprises, on the other hand, has always taken up the lions share of training, and continues to do so. In this sector, which has proved to be remarkably open to technological change, the system is still functioning.

Together with increasing productivity and rising wage levels the labour force employed in the enterprises is decreasing. This imposes another constraint. The optimal number of apprentices trained in the enterprises is given by the number of employees and the future need for qualified labourers. In addition, more young people look for training opportunities today since there is little demand for unskilled labour. Consequently, a growing shortage of training opportunities in the enterprises constitutes a serious problem. Attempt by the administration to open up practical classes in technical schools for those who have not found a training position are an unsatisfactory substitute.

2.2 Professional Education in Agriculture

Attempts to implement professional agricultural education started in the 19th century in combination with efforts to develop agriculture towards an applied natural science. Respective activities were linked to famous names, like Albrecht Thaer, Justus von Liebig, Heinrich von Thünen and others. Numerous institutions like research and training farms, agricultural middle schools and colleges have been founded in this period. While some had to be closed down after some time, others have gradually been developed into High Schools, Academies and later Agricultural Faculties. They engaged in research, technology development and education of qualified manpower for employes in extension and training.

Other institutions founded in this period focused on technical training and education for sons of farmers. The Land Husbandry Schools (Ackerbauschulen) combined learning by doing on the school estate with class room instruction. Students attended school for a period of one or two years and were lodged on the estate. Other types of educational set-ups were developed after 1860. Agricultural schools (winter schools) adopted a system, where students attended classes during two winter terms, while in the summer they worked on the farms of their parents or elsewhere. Both types of institutions earned great esteem and, for a long time, have, until the middle of the twentieth century, been considered the backbone of agricultural education. The first Rural Technical Schools (Berufsschulen) were established after 1870. In 1923 they were given a status comparable to those in the crafts sector meaning, the rural youth was given an opportunity to attend them for up to three years after leaving primary school. These institutions have become the most effective media for the transfer of scientific knowledge into agricultural production. They played an important role in elevating the educational standard of the farming population.

In 1951 regulations for mastership training and trainers' tests were being passed by the federal Government and were implemented until 1957. In this period formal appren-

ticeship training on recognised training farms had become common practice for all prospective agricultural professionals, including those who were to attend a University. Agricultural Technical Schools were established countrywide the attendance of which became compulsory for one day per week (later two days) up to the age of eighteen. Hence, the dual system of professional agricultural education had been firmly established. With the Vocational Training Act (Berufsschulgesetz) of 1969 the system was amended, and since then agricultural professional education is guided by the same regulations as that for crafts and industries (MÜHL, 1998).

The family type farms in which apprenticeship training is being conducted continue to play a central role for the institutionalisation of practical training. With a declining labour force in the agricultural sector there is generally no shortage of training positions, as is the case in the other sectors. School leavers who decide to be trained in the agricultural profession sign a respective contract with their trainer. They normally live in the farmer's family and are expected to work an average of 44 hours per week, including attendance at the Technical School for 12 hours per week. The required period of apprenticeship training depends on the level of schooling which the trainee has obtained and may last for two or three years. Shorter periods of, for example, one year, which are entry-requirements for institutions of higher education, or admittance to Government services are possible.

It may be summarised that professional agricultural education in Germany centred around schools which combined practical training and classroom teaching for a long time. Recognised training farms and compulsory attendance of a technical school were implemented rather late. Finally however, the establishment of the dual system and the implementation of respective regulations resulted in generally recognised professional standards (i.e. qualified labourer, master farmer, qualified trainer) which were formerly missing in agriculture.

3 Improving Professional Agricultural Education in Third World Countries

3.1 The Experience of Morocco

In 1984 the Government of Morocco launched an official request to the German Ministry of Economic Co-operation for assistance in the implementation of a dual system of professional education in agriculture. The background situation was characterised by low productivity and inefficient use of existing resources in agricultural production. Large scale commercial farms run by parastatal organisations, in particular, were assessed to be in a poor shape and agricultural production to be uneconomic. The Moroccan Government was convinced that its objective to improve productivity in the sector was primarily constrained by lack of qualified manpower. At the same time it was believed that a sustainable system could only be achieved if training of practically skilled farm labour could be implemented on well managed and efficient training farms run by

skilled farm managers and trained trainers. Hence, not only farm managers had to be trained, but these also had to be made capable of being qualified trainers (BAUM, 1993).

Between 1985 and 1998 the German Institute for Tropical and Subtropical Agriculture (DITSL), Witzenhausen trained almost 200 Moroccan agricultural professionals. The target group initially comprised of graduates from Universities and Technical Schools. Later, also farmers' sons were included who partly had not received any formal technical training. The Programme was launched by the Food and Agriculture Centre of the German Foundation for International Development. For the first three years thirty participants were trained. In order to facilitate financing the Moroccan Government had agreed to contribute scholarships, which had been allocated by Germany.

The programme was implemented in Germany in a total of 11 training phases of 18-months duration, for 10 to 25 trainees each. Training included a four-month language course, intensive introductory and final seminars of one month each, and a period of 12 months active participation in the daily work routine on a family-type farm or horticultural enterprise. This part was complemented by a series of short intensive subject matter seminars along with the vegetation period. While the practical period was considered a key element, seminars were to enhance a deeper understanding of learnt farm activities and hence, a more effective process of practical learning.

Contents of seminars comprised the secure and efficient handling of farm machinery, including maintenance and repairs, book keeping and farm economics, as well as specific aspects of crop production and animal husbandry. Particular emphasis was given to work pedagogics. This part ended with a test which was designed in accordance with German regulations for the training of trainers. For all instruction the principle of learning-by-doing was strictly observed. The total time allocated to seminars during the twelve months of the practical phase amounted to eight weeks. This left a net period of active farm work of ten months. The overall ratio of four months instruction and ten months farm work roughly matches the time allocation in the German dual system of professional agricultural education.

In 1990 the German Agency for Technical Co-operation started a bilateral aid project with the purpose of establishing the dual system of professional education in the agricultural sector of Morocco. Training in Germany continued and, from the very beginning, the project was able to incorporate skilled personnel from the DITSL programme. Achievements became visible in 1992 when the first group of agricultural students received their practical training on a commercial farm run by a group of returnees from Germany. More former participants were in the process of opening up their farms and joined in later. The number of training farms increased considerably when other experienced farmers, who had not gone through the programme were incorporated in the system and adopted the training methods.

The chosen approach, i.e. starting formal training five years prior to the proper project, has proven to be a decisive factor. The acquired skills and high motivation of the new farm managers resulted in a lasting effect. The former trainees were fully acquainted with the apprenticeship system. They had sufficient command of the required skills and could act as qualified trainers. Consequently, staff who had gone through the programme could act as multipliers (THIEROLF, 1994). This fact contributed considerably to the ultimate success of the project. Assistance was phased out in 1998 when a fully operational system was established.

The training programme in Germany has been complemented by a number of support activities during the entire programme period. They deserve a special mention since they proved to be extremely important for a smooth conduct of the programme. They resulted from a constant exchange of information safeguarding a participatory approach and furthering mutual understanding among the programme partners. These activities comprised:

- Participation of Germans and Moroccans responsible for the programme during the interviews for the selection of prospective participants.
- Study tours of Moroccan Government officials and technical teachers to acquaint them with the German system of vocational education in agriculture.
- Participatory planning and evaluation of the programme with all partners involved, comprising Government officials, participants and professional representatives.
- Contact seminars with former participants in Morocco.
- Evaluation missions by Moroccans to assess the performance of the training programme in Germany.
- Study tours of German trainer farmers to Morocco as official guests of the Moroccan Ministry of Agriculture.

In 1998/99 an effective dual system of vocational training has been implemented in the agricultural sector of Morocco. Countrywide 1,200 training farms had been recognised which cared for 2,434 trainees. 35 Technical Schools with 300 trained teachers and 50 training advisors were integrated in the system (WELTE, 1999). The Government had passed respective legislation regulating the role of training enterprises and schools. 50 percent of the training of qualified labourers (ouvriers qualifiés) had to be performed in the enterprise and 50 percent at school. Normal procedure is a full year of farm work complemented by a full year of schooling. It has soon become apparent that qualified labourers, who had gone through the system had less difficulties in finding employment than others.

From the very beginning it was taken into consideration that the absence of training opportunities on private and state-owned farms constituted a key constraint. While this problem is a frequent one, there are a number of features which differ from programmes of similar kind, which deserve mentioning.

- The programme combined personal and technical assistance, however , in a sequence which is, so far, uncommon. Training of farm managers and trainers commenced five years prior to the start of project operations. This time span was required because the young professionals could not be expected to immediately start as trainers after their return. Rather, a maturing process and additional experience in Morocco was required. Furthermore, it had to be expected that some of the trainees, who had earlier decided to become farm managers and trainers, would change their minds later.
- Since appropriate opportunities for effective practical training, as well as personal experience on being a trainee were lacking in Morocco, the acquisition of respective experiences in Germany was essential. Here, recognised training farms and fully qualified trainers prepared to participate were available. Knowledge transfer was affected by the trainees themselves. After they had understood production patterns in the German socio-economic and cultural environment they were able to select whatever they assessed applicable in the context of their home country. They also acquired an insight in human relationships which existed in Germany between the farmer and his trainee, as well as with his labourers. The personal experience of practical training methods on the farm proved to be an aspect of particular importance. The returnees were, thus, enabled to adopt attitudes of labour management appropriate to a modern society.

It has to be added that some of the framework conditions, which were initially assumed, did not materialise. The intention of the Moroccan Government to supply land for the successful returnees could not be fully implemented. Consequently, only some of the former participants were able to receive this benefit so far. Also those who were to inherit land from their father manage their own farms. Others are employed managers on public farms and agro industry enterprises, have teaching assignments or are employees in agricultural administration, extension and research (MAMVA, 1997). With assistance from the Deutsche Ausgleichsbank[1] a total of 30 percent of the returnees have managed to acquire their own enterprise and engage in training of apprentices in 1999.

Nevertheless, with the measures described Morocco has succeeded in establishing a system of professional education, adapted to its conditions. This success has inspired other countries to launch similar programmes. An example of this is Indonesia, where a policy to improve the system of professional education has become operational. The approach adopted so far is described below.

[1] The Deutsche Ausgleichsbank (dta) programme assists returnees through grants to enable them to start a private enterprise. Since April 1999 the programme is administered by the German Investment and Development Company (DEG).

3.2 *Current Policy to Improve Professional Agricultural Education in Indonesia*

3.2.1 *The Present System of Technical Vocational Education*

Indonesia's population totalled 190 million in 1994. The labour force was estimated at 74.5 million, of which 48 percent were engaged in agricultural production. These contribute 19 percent to the gross domestic product. Employment figures for other sectors are: 25 percent in industry and commerce, 16 percent in service-related industries, including government, 7 percent in forestry and fisheries, and 4 percent in other areas. The literacy rate of the population amounts to 86.3 percent, and 93.5 percent of children attended primary schools in 1994. Unemployment, particularly among school leavers, constitutes a mayor problem. Inadequate vocational training opportunities have been assessed as being a mayor cause of this constraint. The World Bank has predicted a growing wage increase disparity between unskilled and skilled labour. Presumably, this will mainly affect agriculture where, to a great extent, unskilled labour is employed.

Technical vocational education in the Republic of Indonesia has been developed during the past 25 years by the establishment of a total of 3.685 Vocational Secondary Schools (Sekolah Menengah Kejuruan - SMK). They focus on six professional fields, namely Technology and Industry, Tourism and Hotels, Agriculture and Forestry, Arts and Crafts, Business and Management, and Community Welfare. Of these Institutions 703 are public and 2.982 private.

In spite of the achievements awareness grew that the challenges of industrialisation and globalisation, i.e. rapid technological change and increasing competition on the world markets, had to be met by substantial improvements of the system of technical vocational education. Instruction was assessed to be too theoretical with insufficient relevance to the requirements of the country's economy. A growing number of Secondary School leavers were unable to find employment and, hence, constituted an increasing burden to society (REPELITA VI, 1994). Consequently, Vocational Secondary Schools were perceived as being second class institutions that did not promise a better future for their graduates (NCVE, 1996).

The Sixth Five Year Development Plan of 1994 took account of the existing problems by initiating mayor changes in the Technical and Vocational Education system. The plan proposes a complex of measures aiming at increased institutional efficiency and more relevant instruction. By exposing students to practical work, personalities are to be moulded who are confident and self-disciplined. The overall objective is to develop an educational system able to produce human resources which match the requirements of the economy. With respect to the enhancement of practical instruction in the wider sense of a dual system of professional education two elements of the plan deserve special mentioning:

- Implementation and development of Pendidikan Sistim Ganda
- Development of production units at SMK's

The term of Pendidikan Sistim Ganda (PSG) is generally referred to as the Indonesian dual system of professional education. Implemented in 1993, it aims at a substantial improvement of the quality and relevance of vocational training. According to the concept educational institutions and employers, which are referred to as partner institutions, work together in a joint programme of training, placing, and assessment of students. Councils of Vocational Education in which both parties are represented have been formed on national, provincial and school levels.

With respect to the organisation of practicals two schemes were to be implemented. In a "day release" pattern some days of the week are to be spent in the partner institution for a limited period. In the "block release" pattern, on the other hand, one or three months are to be spent in the firm.

The development of production units at SMK's started in 1993. As opportunities for students to gain working experience in the private sector are insufficient, new curricula had been designed to ensure more practical instruction. For this purpose students have to spend the full day at school. Already since 1990 the institutions have been encouraged to make more effective use of their production potential, i.e. farms, workshops, fishponds etc.. Students are regularly employed in these units with the aim to enhance their practical skill. With the implementation of the sixth development plan in 1994 the schools can decide by themselves what to produce. Revenues from the production units can be retained in the institution. They can amount to as much as 25 % of the budget. However, while this orientation of production to existing market opportunities may have distinctive advantages, it also tends to narrow down the range of activities undertaken, which can be detrimental to the training aim.

It can be summarised that important steps have been taken by the Indonesian Government to match its system of technical vocational education with the requirements of the economy by placing more weight on practical instruction in the curricula. While in the past most Vocational Secondary Schools experienced difficulties to find students, it is reported that this situation has recently changed. The new concept takes account of the fact that science and technology may be learnt at schools, whereas this is not so for practical skills. These decisive factors of professionalism can only be acquired through direct involvement in the production process, while length and complexity of the working experience are important. Awareness for educational requirements has been created among the parties concerned and institutional links have been established. This situation paves the way for the implementation of further improvements of the system of vocational education and training. These are essential in view of still existing problems of the Sistim Ganda in Agriculture.

Experience of the Sistim Ganda has been gained in ten pilot institutions spread all over the country. There are obviously mayor constraints which remain to be solved in order to safeguard a profile of Secondary School leavers fully adapted to the challenges of present and future technological development. The following problems are most apparent:

- Although the curricula envisage a share of the practicals of 50 % during the three years of schooling, time spent in the partner institutions normally does not exceed three month. While this period may suffice in certain industries, in agriculture it is insufficient to acquire a confounded working experience.
- Partner institutions for Agricultural Secondary Schools are normally firms of the agrobusiness complex or large plantations. Training, therefore, is bound to be rather specialised, which leaves little flexibility to the graduates with respect to future job opportunities.
- Since there is a general scarcity of partner institutions, opportunities for out-of-school practicals do not suffice. The mayor part of practical instruction, therefore, takes place in the production units of the schools. However, teachers who manage the units and act as supervisors of practical work have not undergone practical training themselves. In the partner institutions students are supervised by experienced personnel. Though these may have sufficient command of the art, they lack qualification in professional pedagogics.

In consideration of the numerous constraints of the Sistim Ganda officials from the Ministry of Education and Culture, together with DITSL staff came together in 1996 in order to plan a co-operation programme. The objective was to introduce key elements of the German dual system of professional education into the existing Indonesian framework. As a result the implementation of a pilot training course has been agreed upon.

3.2.2 Apprenticeship Training for Indonesian Agricultural Teachers

The course was conducted in 1997 for 20 teachers (among which were three ladies) employed at the ten pilot institutions of the Sistim Ganda located all over the country. The participants were graduates from the Agricultural Faculty of the University of Bogor, but had never received any practical training. In spite of this fact, some of them were appointed as instructors at the production units of their respective schools. The course was fully financed by an Asian Development Bank loan under the umbrella of the Agricultural Technology Schools Project.

The objectives of the course programme were:

1. The participants have obtained a complex understanding of the German dual system of professional education. In particular the principle, i.e. practical learning supported by theoretical instruction, as well as the main elements training farms and educational

institutions, were to be known by active personal participation in the work routine.
2. The participants are able to act as multipliers in their schools and can play an active role in the further development of the Indonesian system of agricultural education.

The following course structure was implemented between May 12th and October 11th, 1997:

1. Pre-seminar in Indonesia (3 days)
2. Introductory Seminar in Witzenhausen (4 weeks)
3. Practical phase I on a mixed farming enterprise in Germany (5 weeks)
4. Mid-term seminar in Witzenhausen and Excursions (2 Weeks)
5. Practical phase II on a specialised farm in Germany (5 weeks)
6. Final seminar in Witzenhausen (4 weeks)
7. Post-seminar in Indonesia (3 days)

The course programme comprised of active preparation for farm practicals, subject matter seminars, and a Trainer's Qualification Test, which all participants passed successfully at the end. Although English was the course language, some German language lessons were given in order to enhance understanding of German culture.

During the post seminar conducted in Cianjur, Indonesia, the immediate results of the course have been evaluated and further actions were planned. The seminar was attended by the returnees and their respective headmasters as well as by some key personnel of the Ministry. In the first session a detailed report on the experience gained during practical training was given. After this the German system of dual education was comprehensively explained by the 20 teachers. In a group work session all participants of the seminar identified aspects of the system which could immediately be implemented, and those which had to be dealt with later. Finally, a plan of action was elaborated as a guideline for future action. The responsible Ministry official obliged the headmasters to safeguard necessary changes in their schools. He announced that a sum equivalent to 5.000 DM had been allocated to the schools for this purpose.

The action plan envisaged the following points: For the time being, the production units of the schools would continue to be utilised for practical training, though with a higher degree of efficiency. The Four Step Method, as learnt in Germany, was to be introduced as principle method of practical instruction immediately. In order to obtain a broader base, training of more teachers was assessed as essential requirement.

For the medium term perspective it was agreed that potential training farms have to be identified, and professionals and farm managers would have to be trained to become qualified trainers. Only after achievement of this aim practical training of students could gradually be transferred from the production units to the enterprises.

As a supporting activity key officials from the Indonesian Ministry of Education and

Culture have travelled to Germany. This enabled them to inspect the course conduct and get a comprehensive insight into the German dual system of professional education. As a result of this, current problems and resulting actions were formulated:

- Professional education has to be viewed as investment and as integral part of human resources development and capacity building.
- Regulations for agricultural and trade proficiency have to be reviewed, reformulated and standardised.
- Technical teachers have to obtain a trainer's qualification in addition to their academic degree.
- Curricula have to be redesigned and teaching materials for practical training elaborated.

In summary it was stated that the course was a first step, and a long-term co-operation programme is required, in order to achieve a sustainable success. Unfortunately, the Asian crisis and the Indonesian political disturbances did not permit the programme to be continued immediately.

4 Summary

Unemployment continues to be one of the most serious problems in developing countries. The lack a profound and efficient systems of vocational education which can meet the challenges of rapid technological development and socio-economic change have to be considered an important cause. The German system of vocational education, normally referred to as the Dual System, has recently attracted many Third World Governments as a guideline for the improvement of professional education. This paper intends to assess activities of the German Institute for Tropical and Subtropical Agriculture (DITSL), Witzenhausen for the assistance in implementing an improved system of professional education based on the German experience. Between 1985 and 1998 almost 200 Moroccan agricultural professionals have been trained. In 1990 the German Agency for Technical Co-operation started a bilateral aid project which had the purpose of establishing the dual system of professional education in the agricultural sector of Morocco. The chosen approach, i.e. starting formal training five years prior to the proper project, has proven to be a decisive factor for success. In 1998/99 an effective dual system of vocational training had been implemented. Countrywide 1,200 training farms had been recognised which cared for 2,434 trainees. 35 Technical Schools with 300 trained teachers were integrated in the system.

Technical vocational education in the Republic of Indonesia has been developed during the past 25 years by the establishment of a total of 3.685 Vocational Secondary Schools. Important steps have been taken by Government to match technical vocational education with the requirements of the economy by placing more weight on practical instruction in the curricula. Nevertheless, in consideration of the numerous constraints offi-

cials from the Ministry of Education and Culture came together with DITSL staff in 1996 in order to plan a co-operation programme. The objective was to introduce key elements of the German dual system of professional education into the existing Indonesian framework. As a result the implementation of a pilot training course has been implemented. This was considered a first step and a long-term co-operation programme is required in order to achieve a sustainable success.

Förderung der landwirtschaftlichen Berufsausbildung in der Entwicklungszusammenarbeit – Die Möglichkeiten des Dualen Systems in unterschiedlichen sozial-ökonomischen Verhältnissen

Zusammenfassung

Arbeitslosigkeit stellt in den Entwicklungsländern nach wie vor eins der größten Probleme dar. Das Fehlen eines effizienten Berufsbildungssystems, das dem schnellen technologischen und sozialökonomischen Wandel Rechnung tragen kann, steht hiermit in engem Zusammenhang. Die deutsche duale berufliche Ausbildung erscheint heute vielen Entwicklungsländern als Vorbild zur Verbesserung ihres eigenen Systems. Dieser Aufsatz analysiert Bemühungen des Deutschen Instituts für Tropische und Subtropische Landwirtschaft (DITSL), Witzenhausen, Länder der Dritten Welt bei ihren Bestrebungen, das Berufsbildungssystem zu entwickeln, zu unterstützen. Zwischen 1985 und 1998 wurden fast 200 marokkanische Fachleute ausgebildet. 1990 begann die GTZ ein Projekt mit dem Ziel, ein duales Berufsbildungssystem im landwirtschaftlichen Sektor Marokkos zu erstellen. Der Ansatz, 5 Jahre vor Projektbeginn mit der Ausbildung zu beginnen, hat sich als besonders erfolgreich erwiesen. 1998/99 war ein effizientes System beruflicher Bildung erstellt. Landesweit gab es 1,200 anerkannte Ausbildungsbetriebe, die 2,434 Lehrlinge betreuten. 35 berufliche Schulen mit 300 ausgebildeten Lehrern waren in das System integriert.

Die Republik Indonesien hat in den vergangenen 25 Jahren die berufliche Bildung aufgebaut. Landesweit wurden 3.685 technische Oberschulen errichtet. Es wurden wichtige Schritte getan, den Anforderungen der Wirtschaft an eine praxisorientierte Ausbildung zu genügen. Trotzdem gibt es gerade hier noch erhebliche Defizite. 1996 kamen daher Beamte des Ministry of Education and Culture ins DITSL, um ein Kooperationsvorhaben zu entwerfen. Ziel war es, Elemente der deutschen dualen Berufsausbildung unter indonesischen Bedingen zu übernehmen. Erstes Ergebnis war eine Ausbildungsmaßnahme für indonesische technische Lehrer in Deutschland. Einvernehmlich wird eine längerfristige Zusammenarbeit angestrebt, um nachhaltige Wirkungen zu erzielen.

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