Towards a Competency Profile for the Role of Instruction of Agricultural Extension Professionals in Esfahan

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Abstract

This thesis is aimed at developing a competency profile for instructors in the agricultural extension service in the province of Esfahan in Iran. These instructors are part-time subject matter specialists who cooperate with the Ministry of Agriculture and teach short-term extension courses in different disciplines to farmers. Previous research revealed that the target group of the research generally experience many problems in their role of instructor during extension courses for farmers. The PhD project was conducted to develop a competency profile for this role in the next three to five years. In doing that, a comprehensive review of the literature was carried out, the competency models presented by McLagan (1982) were selected and adjusted to the Iranian extension system, and were tested for the role of instruction. To increase the reliability of the model, different respondents were involved: participating and non-participating farmers in extension courses, agricultural experts, agricultural managers, and instructors.

The research carried out in the project is presented in this book, which contains three main parts and nine chapters. The first chapter is the general introduction, which provides the literature review, problem statement, research design, definition of concepts, study area and the outline of the thesis. Part one of the thesis presents four farmers' studies, part two encompasses two agricultural experts' studies and part three includes the key study of the research and the synthesis. In the synthesis chapter the implications of all previous chapters about the competency profile of the target group are aggregated and the model is triangulated.

The findings of this research show that the evolution of agricultural development and extension has not been convincing during the last decade and that farmers were confronted with many unexpected changes and problems in their work. The Ministry of Agriculture (MAJ) has supported farmers to a limited extent, and much more support is needed in the future. However, the governmental extension services are assumed as being the most important information source for farmers. Farmers were generally pleased with the services of the extension organization and with their courses, as well as with the instructors, but they expect revisions in evaluation methods, the use of instructional technologies, and the duration of the courses and follow up strategies delivered by the instructors. The most important motives of farmers for participation in the courses were performance improvement and personal development.

Respondents of the key study (chapter eight) gave high scores to all components (future forces, ethical issues, outputs, standards and competencies) of the competency profile of the instructors. It was concluded that instructors should perform additional roles apart from instruction. New general and common competencies were inserted into the final version of the competency profile of the instructors. Ultimately, this research revealed that designing a common competency profile for instructors is possible but the profile should be differentiated based on the stratification of the farmer population by variables such as gender, age, level of education, and motives for course participation. Further research is proposed both for the role of instructors and other human resource professionals in the field of agricultural extension in Iran. Also, repeating this study at national and international level, also in different sectors, could enhance professional development in various occupations and thereby socio-economic development in these sectors, and could further elaborate the instrumental use of the model.

This thesis is dedicated to:

My dearest wife Maryam,

My lovely son Alireza,

My beloved parents

Sympathetic Iranian agricultural extension instructors

And

Al Iranian hard-working farmers

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Now that I am completing my very last days of my PhD study, it is time to look back to this long period that was full of ups and downs. I should confess that it was not just me who handled this great burden. I am definitely indebted to many others who directly and indirectly supported me to achieve this success. I would like to thank all of them and appreciate their unfailing help when I needed it. First of all I should praise **great God** for keeping me healthy and able to finish my job; although, I can never express fully my gratitude to my creator for all the gifts I have received.

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Abbreviation	Description
AEIs	Agricultural Extension Instructors
AES	Agricultural Extension Services
AEO	Agricultural Extension Organization
AD	Agricultural Development
MAJ	Ministry of Agricultural-Jihad (Ministry of Agriculture)
HRD	Human Resource Development
HRM	Human Resource Management
HR	Human Resources
OD	Organizational Development
GNP	Gross National Product
VET	Vocational Education and Training
ASTD	American Society for Training and Development
MTAA	Modified Task Analysis Approach
CTA	Critical Trait Approach
SA	Situational Approach
JCAM	Job Competency Assessment Method
TDLBs	Training and Development Lead Bodies
SVQs	Scottish Vocational Qualifications
NVQs	National Vocational Qualifications
YES! PDS	You, Extension and Success! Personal Development System
C-CAP	Core-Competency Assessment Program
NCCE	North Carolina Cooperative Extension
SELD	Southern Extension Leadership Development

DAE	Director of Agricultural Extension
DG	Director General
IS	Information Sources
CS	Coping Strategies
NGOs	Non Governmental Organizations
FAO	Food and Agriculture Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization
GDP	Gross Domestic Product
GNP	Gross National Product
CGIAR	Consultative Group on International Agricultural Research
OECD	Organisation for Economic Co-operation and Development
FRF	Farmer-Related Future Forces
ARF	AEI-Related Future Forces
MRF	MAJ-Related Future Forces
GE	General Ethical Issues
CRE	Course-Related Ethical Issues
ITO	Instructional Technology-Related Outputs
IMO	Instructional Methods-Related Outputs
FCDO	Farmer Competency Development Outputs
GCC	General Course-Related Competencies
GC	General Competencies
TC	Technical Competencies

Chapter One: General Introduction

Overview

The principal aim of this chapter is to provide readers with information about why, how, when and where this PhD study was accomplished. The different stages of the study are discussed and a general theoretical introduction to agricultural development and extension, human resource development, competency models, and the application of HRD competency models in the field of agricultural extension are presented. The problem statement concerns the state of agricultural extension in Iran and its pitfalls, AEIs (Agricultural Extension Instructors) and their professional development in Iran, and the necessity for research into the development of a competency profile for the role of instructors in the extension profession. Subsequently, the research design (general objectives and research questions, basic methodology and research strategy, research instruments, etc.), definitions of concepts, and the reasoning behind the selection of the Province of Esfahan as the study area are described. Finally an overview of the whole dissertation is given.

1.1 Introduction

This PhD thesis is aimed at developing a theoretical framework and then a competency profile for agricultural extension instructors (AEIs) as human resource development (HRD) professionals in the agricultural extension sector of Iran. Therefore, because the study is a combination of HRD, extension, and educational studies, different stakeholders, experts and farmers will be examined. It is important to have a general outlook of the different composite parts before commencing with the research. In this chapter the background to the research and the procedure followed will be described. Because AEIs do not exist independently they must be contextualized within the Iranian agricultural environment in which they operate, as elaborated below.

1.1.1 The state of agriculture in Iran and new challenges

In Iran, like other developing countries, agriculture is one of the most important economic sectors and comprises a considerably high percentage of production and employment. It accounts for over 1/4 of the Gross National Product (GNP), 1/4 of employment, over 4/5 of the domestic food supply, 1/3 of non-oil exports (excluding carpet exports), and 9/10 of the raw material demand of national industries. Agronomy and horticulture are of great importance in Iranian agriculture. These two sub-sectors account for more than half of the total added value of Iranian agriculture (excluding fodder crops). Its share in Iranian GDP has risen from 14.5% in 1978 to 25.7% in 1997 (National report: Position of Agriculture in Iranian Economy, 2003). Similarly Gilanpour (2006, p.328) in his recent report about the Iranian economy and the position of the agricultural sector in Iran states:

> "Iran's economy has been shaped by oil export, so that the industrial and service sectors depend heavily on oil income. We cannot say that the agricultural sector is fully independent of oil income but its rate of dependency is very low in comparison with other sectors. This situation makes agriculture's role instrumental to Iran's economy; nevertheless, economic investment, especially in the agricultural sector, is still low. One of the main reasons for this is government intervention. Low investment in the agricultural sector means that an educated labour force will not be engaged in this sector because of the resultant low employment opportunities. Consequently, about 49 percent of farmers in Iran are illiterate at the present time".

Table 1.1 presents the changes that took place in Iran's economic status during the years 1988 until 2004. The table shows that the role of the agriculture sector in the economy of Iran has diminished from the year 1988 (15.9%) to the year 2004 (13.7%); while the industrial sector has improved from 16.2% to 24.5%, and the services sector accounted for more than 50% of the economy in the years concerned. The table also indicates that crops (58.3% in 1988 and 61.8% in 2004) and livestock (34.5% in 1988 and 30.3% in 2004) are the agricultural sector's major production outputs.

Table 1.1 Changes in structure of Iran's economy, 1980-2004 (percent)

	1988	1990	1995	2000	2004
Agriculture	15.9	15.2	15.5	14.3	13.7
Industry	16.2	17.4	17.6	21	24.5
Services	52.3	50.9	51.6	52.4	51.4
Crop	58.3	58.3	61.1	60.8	61.8
Livestock	34.5	33.9	31.1	32.4	30.3
Forestry	1.2	1.1	1.2	1.2	1.3
Fishery	21.1	2.8	2.7	2.7	2.4

Source: Iran's Central Bank; quoted by Gilanpour (2006, p.328)

Similarly, Alizadeh (2006), the head of the investment support office for agriculture in the ministry of agriculture (MAJ) declared that in the year 2006 the agricultural sector accounted for 18% of non-oil exports, 20% of the GDP and 25% of employment in Iran. He also claimed that 92% of the country's food was supplied by 4.3 million producers in this sector. He then concluded that there is a large capacity for investment in agriculture by governmental and private sectors.

Nevertheless, there is a variety of evidence that agriculture in Iran still lags far behind what it could potentially achieve considering the available resources in the country. For instance, research reveals that more than 50% of the total available land, water, and natural resources have not yet been used in agriculture and only 37% of all cultivable land and 58% of all acquirable water, have been utilized (Tahmasebi, 1998). In addition, sustainable land use has

not yet been achieved in Iran. As evidence, about 30% of the forests located in the North of Iran have been destroyed over the last two decades. Furthermore, large pasture and grassland areas have been rendered unproductive as a result of overuse by the cattle of nomads and farmers (Darvishi, 2003). Karshenas (1994) claimed that the difficulties within Iranian agriculture were caused by the mismanagement of human resource by actors within the sector, and not because of shortages of natural resources in agriculture. Foltz (2002) also claims that mismanagement is the major reason for the partly drought-related water crises in previous years. In the same way, it was reported that about 60% of the 82 billion cubic meters of water used in the agricultural sector failed to reach crops. Many specialists also confirm this (see McLachlan, 1988; Khatoonabadi, 1999; Afkhami, 1998; Karami & Rezaei-Moghaddam, 2005). Kalantari (1995, p. 9) named the most critical issues that limit increases in productivity in the agricultural sector of Iran, as:

> "the small size of agricultural lands and production scales, the restrictive macro policies in the agricultural sector, financial difficulties of the majority of farmers, the need for greater funds, investment in the infrastructure, low quality of products and insufficient technical skills of farmers, and the inefficiency of public service in promoting agricultural extension schemes".

Based on the research of Karami and Rezaei-Moghaddam (1998), both socio-economic characteristics and environmental conditions of the farm have increased the poverty of Iranian farmers. They suggest that smallholder farmers with under-developed socio-economic and environmental conditions are relatively poorer. They conclude that poverty is a major reason for unsustainable agriculture. Lack of sufficient farm management competencies effectuate higher soil erosion, over-fertilisation, inadequate application of manure, lack of fallow, overgrazing, burning of crop residue, and over-use of pesticides.

Correspondingly, although rural areas are the most important regions for agriculture in Iran, unfortunately, little attention has been paid to these productive areas so far. Barichello (2004, p. 2) also reported this fact when he said:

> "…for most developing countries, the bulk of their poverty is found in rural areas, which raises questions about the structure of these economies, specifically the relative size and importance of the agricultural sector…"

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Moreover, Ashley & Maxwell (2001) stressed that this phenomenon is not just a matter of developing countries but it is a worldwide problem (see also Johnson, 2000; Lanjouw & Lanjouw, 2001; Foster & Rosenzweig, 2003). In Iran, rural economic activities are related to three major sectors (agriculture, industry and services). The total population of villagers in Iran is 25 million (about 1/3 of the whole population) of which the majority are poor. About 50% of the active rural population are working in the agricultural sector, 27% in industry and 23% in the services sector. The total cultivated land area is about 18 million hectares, while the total number of rural people's livestock amounts to 92 million (The Canadian Trade Commissioner Service: Country profile of Iran, 2001; Country Report: Iran Position of Agriculture in Iranian Economy, 2003). All these phenomena verify the importance of the role of agriculture and, as a result, of villagers to the Iranian economy.

Similarly, Bageri and Shahbazi (2003) discovered that a great number of Iranian farmers lack technical competencies at many stages of farming activity such as planting, harvesting, plant protection and using agricultural machinery. These studies disclosed that 75-82% of young farmers need to be trained in all the abovelisted aspects of farming. The Ministry of Agriculture knows this status and has established a consultation committee composed of 17 Iranian and 15 international consultants. The major function of this committee is to try to address the indicated barriers in the agricultural sector (Lotfi, 2004).

To give an overview of the development of agriculture in Iran, it can be said that after the revolution in 1979, agricultural development (AD) and self-sufficiency were given high consideration by the new revolutionary governors. In the first five years after the revolution, the agricultural sector was the only sector with a positive value added growth rate. The policy makers endeavoured to adopt different strategies and policies, one of which was the introduction of five-year agricultural plans, to achieve their goals. Some of the most effective policies that continue to be considered by policy makers are "reformed land distribution, farmland reclamation, minimum price setting for staple commodities with a view to fix prices and protect farmers' rights" (LNV office, 2003, p.1), "implementation of agricultural extension plans such as presenting extension courses, Rural Islamic Councils, Co-helpers, Construction (Sazandegi) groups, Rural Youth Clubs"(Heidari, 2000; 2001), research- extension farm models, rural cooperatives, extension houses, soldier-teachers, soldier-extension agents, etc. (Mirzaei, 2004). In the next section more explanation is given about agricultural extension and the new challenges facing it.

1.1.2 Agricultural extension and the challenges ahead

Van den Ban & Hawkins (1996) describe agricultural extension services (AES) as a means of enabling farmers to clarify their own goals and possibilities, to become better decision-makers, and to stimulate desirable agricultural development by transferring information from a global knowledge base that is filtered through local research to farmers. Change in agriculture has brought about new challenges for farmers in relation to production and technology. As a result more attention should be paid to agricultural extension. Van den Ban (1996) iterated the necessity of a progressive agricultural extension system. He pointed out that in many countries agriculture is in a process of rapid change and stressed that the demand for food is growing, as is international competition, labour productivity, and the rate of agricultural research. However, he also noted that employment opportunities and governmental supports for agricultural products are decreasing. Therefore, all these changes have many implications for agricultural extension which must adjust itself to them. For instance, according to Rivera and Gustafson (1997), agriculture and farming, informational technology, and governments are all in the process of changing. These socio-economic, political, and technical changes inevitably impact the institution of agricultural extension and also exert pressure on it to change. They discussed three world-wide public policy trends: privatization, revitalization and decentralization. These three policies underpin the core and fundamental part of extension systems in many countries.

Considering the changes and challenges in agricultural extension today, one of the roles of an extension organization should be to contribute to the development of agriculture by helping villagers to become aware of the changes in their environment. Whilst these changes do offer new opportunities for farm development they can also threaten development because it is no longer possible to earn a decent income from the present farming methods (Van den Ban, 1996).

Therefore, a major role of agricultural extension is to help farmers with the knowledge construction process and to support them to learn from their own experiences (Van den Ban & Hawkins, 1996). There are many different definitions and interpretations of extension from various extension specialists. Most definitions support previous statements and assume

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extension officers and personnel as: supporters of farmers, facilitators for knowledge exchange between researchers and farmers, introducers of new techniques and information to farmers, supporters of innovation, creativity, and self-confidence of farmers, relationship-builders between government and farmers, etc. (Campbell & Barker, 1998; Prawl, Medlin & Gross, 1984; Rathore et al., 2001; Swanson, 1984; Sulaiman & Hall, 2003). Nonetheless, extension services vary from country to country and might be implemented through the application of different approaches.

"Traditionally, extension organizations in many countries, particularly in the developing world, persued goals of technology transfer, though the emphasis differs from the country to country" (Nagel, 1998, p.45). Nevertheless, this has been gradually shifting from a knowledge transfer to a knowledge-share concept and farmers are no longer assumed as the sole recipients of new technology and science; instead, they are now contributing to the learning and teaching processes. The role of agricultural extension agents is also changing from transferring knowledge and technology to consultants, advisors and facilitators of the farmer learning process (Lambert & Elix, 2003; Shim, 2006).

> "In moving beyond technology transfer through the traditional adoption and diffusion processes (see for example Ison & Russell, 1991; Cary & Barr, 2002; Van de Fliert, 2003), to a shared approach to knowledge generation and its application through adaptive management, publicly funded, agency-based staff will play an essential partnership role with rural landholders in bringing all the relevant forms of knowledge to research project planning, implementation, monitoring and review (Lambert & Elix, 2003, p9)."

Different approaches (often used in combination with other approaches) have been applied by extension policy makers of different countries. Some of most important approaches are ministry-based or general, commodity-based, university-based, training and visit (T&V), integrated or project-based, animation rural, client-based and client-controlled, extension as a commercial service, participatory or privatized extension (Baxter, Slade & Howell, 1989; Benor & Harrison, 1977; Nagel et al., 1992; Rauch, 1993; Umali & Schwartz, 1994). However, in Iran, like many other Middle Eastern countries, a mixed approach is used with a focus on governmental or common extension approaches.

In sum, it could be said that agricultural extension, as a whole, aims at improving the competencies (knowledge, skills and attitudes) of farmers in order to improve their career performance. This latter description discloses the notable relation between HRD and extension. The only difference is that HRD is mainly used in formal and business environments (companies and organizations) and not in circumstances in which agricultural extension normally plays a role. Thus, it must be clarified that agricultural extension has two sides. One side is related to official organizations (MAJ) and the other side is connected to farmers and is therefore informal and non-organizational. However, this research intends to strengthen the linkage between the domains of HRD and extension. In the following sections, descriptions of HRD and organizations will be offered.

1.1.3 Human resource development and organizations

HRD, as a technical term, was coined by the American writer Leonard Nadler (1970) and defined originally as "a series of organized activities conducted within a specified time and designed to produce behavioural change of organizational members". Megginson et al (1993) used the term of HRD to describe an "integrated and holistic approach to changing work related behaviour, using a range of learning techniques and strategies". Walton (1999, pp. 53-54) quotes the definitions of Stead and Lee (1996) when he states:

> "HRD is an extension of training and development with a specific orientation towards organizational learning interventions designed to improve skills, knowledge and understanding. HRD has a wide and holistic origin, focusing on interplay of global, national, organizational and individual needs."

Torraco (2005, pp. 250-253), the editor of the Journal of Human Resource Development Review, gives another description of HRD and its new challenges. He cites the definition offered in the McLagan study (1989) and says:

> "HRD has been defined as the integrated use of training and development, organization development, and career development to improve individual, group, and organizational effectiveness".

Torraco (ibid) continues that:

> "This definition of HRD has significantly shaped the identity of the field. Other definitions and metaphors for HRD continue to appear. HRD has changed

significantly since the McLagan study. HRD no longer limits itself to providing a combination of training and development, organization development, and career development. In this respect**,** McLean (1998, p. 375) indicates that each European country has different definitions of HRD. For instance, "in France: the term of 'development social' is often used as a synonym of HRD; in Germany: the field corresponding to HRD is marked by a training industry, consultants and personnel specialists; in the Netherlands: HRD is related to all training and development interventions that are made to create and further develop human expertise within the context of an organization; in Russia: HRD is associated with personnel staffing, selection and training, the focus being on managing the employee pool rather than helping individual employees to develop; in UK: key elements of HRD include activities and processes having an impact on organizational and individual learning."

Horst et al. (1999, p.145) illustrated the new perspectives of European organizations of HRD roles and functions. In his view:

"European organizations are increasingly dealing with strong competitive markets and/or fast changing technologies. In response, their strategies focus on improving organizational flexibility. Human resources are regarded as a key to competitiveness. Employee learning and related strategies, such as knowledge management/ knowledge sharing and creating a learning culture, are key issues for these organizations. The role of HRD professionals is changing from trainer to consultant. Their strategic role is to link HRD closely to business; their practical role is to provide learning opportunities for employees."

Garavan et al. (1999, p. 169) similarly characterized a number of HRD dimensions in relation to organizations and pointed out:

- HRD is intrinsically related to overall business strategy and competitive advantage.
- HRD is conceptualized as an investment in human resource capability rather than an employment cost.
- HRD is concerned with change at all levels, both organizational and personal.
- HRD views the employee in a "holistic" sense.
- HRD is concerned with identifying and enhancing the core competencies required at each level to meet its present and future objectives.
- HRD focuses on the management and delivery of training activities within the organization.
- HRD concerns itself with selecting the best delivery systems designed to enhance human resource competencies.
- HRD is concerned with organizational and individual learning.
- HRD consists of a set of generic activities associated with learning.
- HRD is a social and discursive construct.
- HRD is concerned with how good human resource development strategies are reinforced by and reinforce other HR strategies.

Through HRD the performance of workers and entrepreneurs is optimised and a contribution is made to their sustained employability and flexibility, entrepreneurial success, self-initiated and managed income generation, and the organisation they work for or by organisations in their socio-economic environment (McLagan, 1983; 1988; 1989; 1996; 2000; McLagan & Suhadolnik, 1989). Regarding the definitions of HRD and the relationship of HRD and organizations it was found that HRD specialists concentrated on developing the competencies of their employees because of their focus on formal organizations and business affairs. Despite this apparent inward focus organizations cannot avoid outside interactions with consumers, competitors and so on. Therefore, although in our research, the target organisations were extension organizations and the target group AEIs and employees it is clear that both extension organizations and AEIs have much external contact with other organizations, groups and individuals. However, the main audience for AES/AEIs will be the individual farmers and farmers' associations. In the next part of this chapter HRD competency modelling in agricultural extension and the role of HRD in the agricultural sector of Iran will be treated. First, a brief description of the definitions of competency, the use of competency in education and research, the most popular competency models, and some extension competency models will be discussed.

1.1.4 Definition of competencies

There are again many definitions of competencies available. Hill and Houghton (2001, p.153) quote from Hoffman (1999) and introduce three approaches that are used for defining competency:

> "In the first view competency is defined as observable performance. The second approach refers to the quality of the outcomes of a person's performance. The third approach perceives competency as an expression of the underlying attributes of a person."

In brief, six common characteristics of competencies have been defined by different authors in the field: 1) they are context-bound 2) they are indivisible 3) they are subject to change 4) they are connected to activities and tasks 5) they act as indicators for learning and development 6) they are interrelated (Biemans & Poell, 2003; Biemans et al., 2004). Recently, the interpretation of the concept of competence and competency has tended to be far more holistic.

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The notion of competencies as clusters of abilities and capabilities of individuals has become more popular. Mulder (2007) presented a list of different definitions of the competency concept and declared that competence, competency and competencies are all used by various researchers alternatively. Nevertheless, in his view, competence is the general capability of a person or organization; while, competency is a part of competence. He then introduces some definitions of competencies as below:

- Competencies are capabilities, capacities or potentials and can be understood as characteristics of persons, teams, work units or organizations which enable them to attain desired achievements;

- Competencies comprise of integrated meaningful clusters of knowledge, skills and attitudes;

- They form a necessary condition for reaching an achievement; for example carrying out duties, even in an ill-structured and constantly changing environment, solving problems, executing a job, obtaining a certain result, making decisions and taking responsibility;

- Competencies are neither explicitly nor externally obvious; they are abilities which become apparent by a certain achievement in a specific situation. Levels of competencies in an individual can, therefore, only be inferred by analyzing achievement. Initiative, decisiveness and customer friendliness, for example, can not be determined without observing a person putting them to use in practice or in simulated instances;

- To a certain extent competencies are portable from one situation to another and are also transferable in that respect;

- Competencies are concerned with the results and achievements of organizations, work units or individual jobs, in areas, for example, of food safety, purchasing management, marketing management and accounts management;

- They are apprehended at certain levels and in many cases can be further developed; level of proficiency which can be differentiated are, for example, advanced starter, competent, proficient and expert;

- Competencies can be presented both in persons and systems, for example, the capabilities of persons and the knowledge that is installed in computer files.

Mulder (2007) also compared over forty definitions of the concept of competence and distinguished their differences based on the following dimensions:

"Job versus role focus, context free versus context specificity, knowledge versus capability, behaviour versus ability, specificity versus generality, learn-ability versus un-changeability, performance versus development orientation, core versus peripheral capabilities, and the person versus the system as carriers (Mulder, 2007, p.6, in press)."

However, in this research the definition of McLagan (1989, p.77) is originally taken into account. According to her, competencies are "the area of knowledge or skills that are critical for producing key out puts; they are internal capabilities which may be expressed in broad, even infinite array of on-the-job behaviours".

1.1.5 The use of competency concept in education and research

Here three important acronyms of competency and their usage are briefly illustrated.

1.1.5.1 Competency-based education

The competence (competency) concept has a rather long history in education and training both in the research and practice field. The various publications and research on competence-based organizational training and teacher training in the U.S. over the years sparked interest in competence and the competence concept for research. The main intention and also reason for the popularity of the competence-based concept held by many stakeholders in the vocational education and training (VET) field is to reduce the gap between the labour market and education. This idea comes from the expectation that VET should enable learners to acquire the kinds of competencies needed for their actual professions and to be good citizens in the future. Moreover, learners should be able to continue developing their competencies in their professional working life (Biemans & Poell, 2003; Biemans et al, 2004)

1.1.5.2 Competence development

Mulder (2001, p.10) illustrates the purpose of competence development and says:

> "Competence development is aimed at shifting attention from knowledge to the application of skills. During the last decade the issue of competence development has again been receiving a great deal of attention. Competence development implies that conditions have to be created for Human Resources Development activities. It also emanates from the idea that board and management consider it important that the organization further develop itself and that therefore education is a necessity for everyone."

Many organisations, particularly larger ones, are using competencies to manage and implement change in their organizations.

1.1.5.3 Competency assessment

Competency assessment is the process of comparing an individual's competencies to those of a competency model (Mulder, 2001, p.9). There are at least nine reasons given highlighting the advantages of applying a competency assessment (Mulder, 2001, pp.9-10):

1. Competence-oriented training implies a strategic stronghold of human resource development activities in an organization.
2. It supports and accelerates a positive learning and development climate in the organization.
3. It provides better and more comprehensive needs assessment by competence profiling and employee appraisal of the organization.
4. It helps individuals to manage their learning processes in the organization and even contributes to the process of lifelong-learning.
5. Competence analysis offers a better basis for purchasing Human Resource Development services, including training.
6. Competence profiling increases transparency concerning the added value of HRD services in the context of career development.

7. A continuous competence assessment increases the contact between participants and executives in organizations and helps learners to put their acquired knowledge into practice.

8. It stresses non-formal training and learning processes that explicitly reinforce the quality of learning by providing extra opportunities in the actual and labour situation for learning and development.

9. Competencies offer a reliable basis for testing the effects of HRD activities.

1.1.6 HRD competency models

Various competency models have been developed by many HRD researchers in the last decades. Rothwell and Lindholm (1999, p. 91) define a competency model as:

> "A usually narrative description of job competencies for an identifiable group, such as a job category, a department or an occupation. It describes key characteristics that distinguish exemplary (best-in-class) performers from fully-successful performers."

Additionally, Draganidis and Mentzas (2006, p. 55) describe competency models as "narrative descriptions of the competencies for a targeted job category, occupational group, division, department or other unit of analysis". They express their definition as follows:

> "Competency model is a list of competencies which are derived from observing satisfactory or exceptional employee performance for a specific occupation. The model can provide identification of the competencies employees need to develop in order to improve performance in their current job or to prepare for other jobs via promotion or transfer. The model can also be useful in a skill gap analysis, the comparison between available and needed competencies of individuals or organizations (op. cit., p57)."

It should be said that the competence concept was primarily initiated by commercial companies; a great number of national and international companies and agencies like Amoco, Dupont, Federal Express, Proctor and Gamble, and Sony are developing competency models to improve the quality of the employees they hire and to improve employee performance in the workplace. A national survey of American employers revealed that, surprisingly, six out of the

seven desired traits for entry-level workers were non-academic (Ayers & Stone, 1999). Since competencies establish the requirements needed to perform a job, competency models can be used as tools for the following purposes:

• Employee recruitment and selection tool;

• Employee assessment tool;

• A tool to develop employee training and curriculum orientation;

• A coaching, counselling, and mentoring tool;

• As a career development and succession planning tool (McLagan, 1996).

Therefore, competencies are the application of knowledge, technical skills and personal characteristics leading to outstanding performance and competency models are designed around the skills individuals and groups need to be effective in the future and are used for making human resources decisions (Stone & Bieber, 1997). For competency models to be useful, competencies must be correlated to job activities. If competencies are to be used as selection, training, and development criteria, such criteria must be validated as reliable predictors of job performance (Buford & Lindner, 2002). Competency models can be built for individuals, specific jobs, teams, units, or an entire organization. When implemented, competency models can be applied to a number of human resource (HR) systems: (a) pre-employment preparation, (b) interviewing and selection, (c) orientation and training, (d) career development, (e) performance appraisal, and (f) succession planning.

It is evident that the field of competency development is growing in popularity with administrative management in businesses and agencies world-wide (Stone, 1997). Hence, many HRD models have been introduced by different researchers to support employees and employers and to improve their performance. In this section some important and popular HRD models are reviewed (McLagan, 1983; 1989; McLagan & Suhaldolnik, 1989; Bernthal et al, 2004).

In the majority of these HRD models, major attention has been paid to the "competency profiles" of employees. An important reason to collect data and build competency models is that they are powerful decision making tools and can be used for self-evaluation and self-development, but also for curriculum development, course development and professional

licensure (Mulder, Wesselink & Bruijstens, 2005). In table 1.2 some competency modelling methods used by different researchers, their targets, tools and major focus are displayed.

Table 1.2 Competency modelling methods

Title		Target	Tool	Focus
The Modified Task Analysis Approach		Concrete, less abstract jobs	Modified task analysis	Cognitive knowledge and skills
The Critical Trait Approach	The Job Competence Assessment Method (The Process-Driven Approach) The Modified Job Competence Assessment Method	Professional, managerial, and executive roles, Abstract job	Behavioural Event Interviews observation Interviews	Critical traits, behaviours, and other characteristics
	The Generic Model Overlay Method (The Borrowed Approach)		An off-the-shelf generic competency model, From another organization	
	The Customized Generic Model Method (The Borrowed-and-Tailored Approach)		A generic model + Validation	
The Situational Approach	The Flexible Job Competency Model Method (The Output-Driven Approach)	Abstract job, Future job	Wide variety of comprehensive information sources, Future assumptions	Work outputs, quality requirements, competencies, and roles
The Invented Approach		Job incumbents are not the best source of information	Systematic process of decision-makers	
The Trends-Driven Approach		Changing job		Key trends or changes, what people should know, do or feel to manage those changes
The Work Responsibility-Driven Approach			Group activities of exemplary performers, organizational superiors, group facilitators for 1-2 days	Outputs, competencies, quality requirement from work responsibility

Source: Shim (2006) quoted from Dubois (1993); Lucia & Lepsinger (1999); Rothwell (1999)

Shim (2006) implemented a similar study as that presented in this research and developed an exemplary competency model for the Korean extension system. Following a comprehensive literature review about competency models and profiles she decided upon, and justified the use of, the ASTD competency model in her study. She applied the 2004 version of the ASTD competency model as she thought that model was more likely to be useful for her target group. However, her choice of the ASTD model also supported the idea that this model is generally the most suitable to the extension instruction area. On pages 13-17 of her dissertation she introduces some researchers who have applied competency modelling studies and notes:

> "Dubois (1993) suggested three major approaches for designing competency models: (1) Modified task analysis approach (MTAA), (2) Critical Trait Approach (CTA), and (3) Situational Approach (SA); in which the competency modelling methods used by McLagan (1990) is a kind of Situational Approach. Dubois (1993) also described five methods for building a job competency model from the Critical Trait Approach and the Situational Approach. Lucia & Lepsinger (1999) listed seven competency modelling methods. The Job Competency Assessment Method (JCAM) uses interviews and observation of outstanding and average performers to determine the competencies that differentiate them in critical incidents. Dubois (1993) summarized the advantages of adopting a flexible job modelling approach as: (1) job competency models that result from raw materials (e.g. competencies, job outputs, roles, and so forth) are considerably more durable over time than are competency models derived from other methods; (2) these competency models are easy to update as the work requirements change; (3) by using a flexible approach, competency models can be determined for jobs that do not yet exist, and (4) competency models constructed in this manner are readily available for doing in-depth micro-level needs analyses since they support the use of a variety of individual and group analysis perspectives. The flexible job competency modelling method needs the following steps: (1) assemble and review all available information that is pertinent to the job, (2) identify an expert panel consisting of senior organizational leaders, managers, or exemplary subject-matter experts, (3) develop present and future assumptions about the job in the context of the organization, (4) develop a job outputs menu, including (optional) quality criteria for each output, (5) construct a job competencies menu and the behavioural indicators for each competency, (6) determine a menu of job roles through a cluster analysis of the job outputs, (7) construct one or more generic job competency models, and (8) brief the client or client group on the project results and prepare the final project products."

Because the UK and the USA are two of the countries with the longest history of developing competency modelling research, a short look at some important competency

modelling research in both countries is presented below and some clarification of the McLagan (1980) competency model will be presented at the end.

1.1.6.1 United Kingdom HRD competency models

In the United Kingdom, different competency model-makers have emerged. Horton (1996) and Massey (1999) focused on the use of competency in the civil service. Horton (2000) in his review research illustrates the works of Samuels (1998), Stevenson (1976), or Talbot (1999) as other movements in the area of competency modelling in the United Kingdom. She highlighted the special position of "*Standards for training*" that were introduced in 1992. Training and Development Lead Bodies (TDLBs) developed the National Vocational Qualifications (NVQs) and the Scottish Vocational Qualifications (SVQs) to raise the level of competence of all those engaged in training and development. Horton (2000, p. 361) declared:

> "Many agencies and departments looking to raise the standards of competence of their lower level staff and their technical and professional officers are using National Vocational Qualifications (NVQs)."

While doing this, TDLBs have identified four phases of activity in the training cycle: the identification of training needs, the design of strategies, programs and activities to meet those needs, the delivery of those strategies, programs and activities and the evaluation of outcomes. However, this model is most applicable for technical and vocational activities and not for appraisal of professionalism. This is one of the reasons that this model was not considered in the present study.

1.1.6.2 United States HRD competency models

Rothwell and Lindholm (1999, pp. 91-95) wrote a review of the evolution of competency modelling and research in the USA. This review cites the work of Flanagan and Landmark (1954) as: "a precursor to competency modelling". Other important competency studies and competency modellers in the USA are also presented including the works of White (1959) and McClelland (1973) as "foundations of competency modelling"; the pioneering work of McLagan (1980); the work of Boyatzis (1982) as the maturity of competency modelling; the work of the American Society for Training and Development (ASTD) which was developed

by McLagan in the 1980s that publicised competency modelling; and finally the work of Spencer and Spencer (1993) as a unique effort for making competency modelling accessible. Prahalad and Hamel (1990) are mentioned in relation to organizational core competency and Ulrich (1997) concludes the review as "going beyond competency to organizational capability".

As stated above, the ASTD had a great role in both pioneering and publicising competency modelling. They have conducted various role studies on HRD professionals. With respect to methodology, these influential role (or HRD model) studies will be used in the current PhD project since they have wide applicability, are well recognized, are frequently applied within the HRD research community across the globe, and are also quite appropriate for the assessment of professionals in various fields.

The core of this methodology is that large groups of experts and HRD practitioners will be surveyed to discover the tasks, roles, outputs and competencies that are needed for effective HRD practitioners (e.g. agricultural instructors). The ASTD HRD model which was developed by McLagan (1989) is used in this research and consists of several rounds of enquiries, investigations, collaboration with many partners, and finally elaboration. It encompasses the following list of components:

- 13 future forces that shape and drive HRD outputs and competencies in the future;
- 74 outputs (products and services) that should be realized by HRD practitioners;
- 35 competencies for HRD practitioners;
- Standards in the form of quality requirements for each of the HRD outputs;
- 13 ethical issues that transcend individual outputs and operate as standards that must be adhered to whenever ethical challenges arise in HRD work.

These lists are not meant to be limiting; rather, they provide the language to use in discussions about various aspects of HRD work. Therefore, this model provides a multidimensional approach for developing a competency profile for the target group (McLagan, 1989; McLagan & Suhaldolnik 1989).

As stated earlier, the American HRD model is widespread and is applicable in various companies, organizations or agencies. It has been successfully introduced to a variety of target groups. In spite of all the criticism of Patricia McLagan's model of HRD, it is still deemed by many researchers as the best and most comprehensive and effective HRD model inside, or outside, the USA.

Nevertheless, there is a continuous effort to develop and introduce new models of HRD in the United States. For instance Holton, Burke and many others are trying to recreate a new model that is more inventive, dynamic, and theoretically sound (Mclean, 1998). In this regard a relatively new competency model was generated by the ASTD in 2004 in which the focus was on workplace learning and performance, areas of expertise and personal, interpersonal and business/management competencies (Bernthal et al., 2004). Although this model is an improved version of a previous one, it is still in its evolutionary phase and needs to mature in the coming years.

1.1.7 Competency modelling in the agriculture extension field

Agricultural development and extension in developing and changing societies requires, amongst other interventions, intensive HRD. HRD is considered to be important in change processes. This holds both for individuals and organizations.

Organizations are increasingly aware of the fact that HRD plays a crucial role in their success and survival. In the field of agricultural extension different competency models have already been presented. The vast majority of these extension competency models are the work of American extensionists.

Stone and Bieber (1997) support the use of the competence concept in extension organizations. They stress that extension organizations should consider expanding the use of competencies as a foundation for organizational change and improved performance. Cooper and Graham (2001) also highlighted the competencies extension agents should possess in their jobs. They argued that change has been necessary to meet the demands of society throughout an organization's existence.

To be truly effective, competency models must have strong links to the strategic issues of the extension organization. Identifying the competencies that will help us to anticipate new ways of perceiving and thinking about complex problems should be our starting point as we strive for relevance, usefulness and quality in our extension education programs (Stone & Bieber, 1997).

Shim (2006, p. 39), in her dissertation, quotes from Liles and Mustian (2004) and gives some examples of these studies:

> "Texas Cooperative Extension (2003) has developed a competency based professional development system, called **"YES! PDS"** (You, Extension and Success! Personal Development System). Michigan State University Extension (2003) has also designed a Web-based competency assessment tool, C-CAP (Core Competency Assessment Program), and North Carolina Cooperative Extension has developed seven core competencies and competency based training and organizational development system. North Carolina Cooperative Extension (NCCE) identified the seven core competencies and continuously validated and refined it throughout the organization (Liles & Mustian, 2004). The Assessing Supervisory and Management Skills Assessment Centre at the Minnesota Extension Summer School and the Ohio State University Extension County Chair Assessment Centre observed management skills of extension professionals using fifteen supervisory/management competencies (Haynes, 2000). The Southern Extension Leadership Development (SELD) program uses twelve leadership competencies in four categories for extension administrators (Ladewig & Rohs, 2000)."

In 1993, the Extension Committee on Organization and Policy Personnel and the Organizational Development Sub-Committee in Texas developed a list of relevant core competencies used as part of a national needs assessment to determine existing competency levels and staff development needs.

Competencies that are needed for effective support of agricultural development cannot be acquired through initial education alone. Certain competencies need to be developed in further training and on the job. Shim (2006) introduced the Texas Extension Competency Model as a prominent competency model in the US agricultural extension area (figure 1.1).
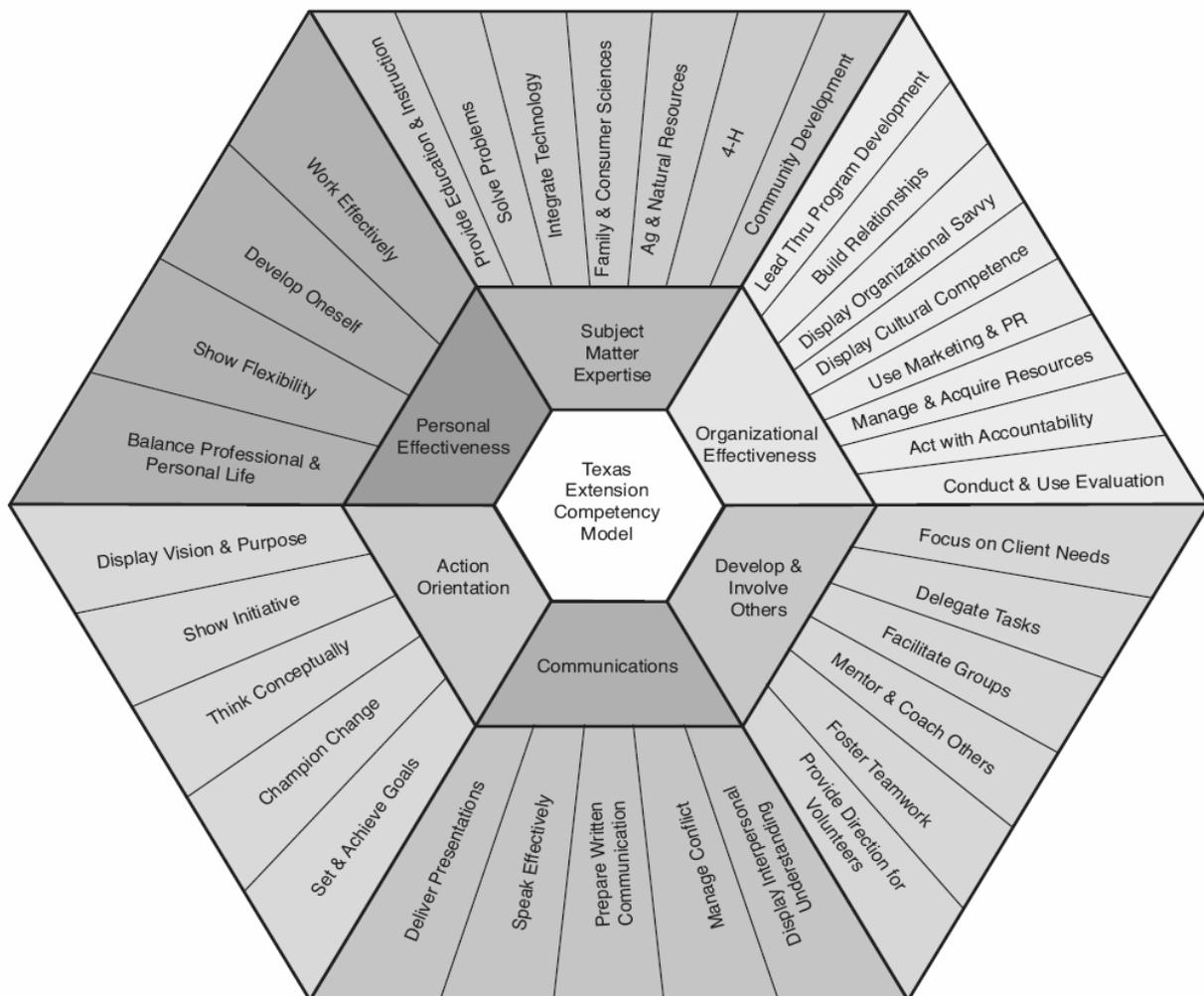
Figure 1.1 Texas Extension Competency Model

Shim (2006, pp. 37-43) lists the extension researchers who have attempted to develop competency profiles for extension personnel. She refers to the researchers listed below and briefly explains their work:

"Mosher (1966) introduced eight elements of professional competence of agricultural extension employees such as extension agents, research workers, and teachers. Cho (1992), a Korean researcher, identified and assessed the professional competencies needed by Korean extension agents as educators. Kim, another Korean researcher (2003) identified 18 competencies of Korean extension workers in four main areas: (1) performance consulting, (2) performance improvement, (3) customer satisfaction, and (4) leadership development. Seevers et al. (1997) identified clusters, abilities, and other characteristics essential to all successful extension professionals. Gim (1997) analyzed the self-rated competence of

education program planning of extension agents, which was classified in 11 procedures and 55 activities. Cooper & Graham (2001) identified the competencies needed to be successful county extension agents and county extension supervisors in Arkansas. The competencies were categorized in seven areas: (1) program planning, implementation and evaluation, (2) public relations, (3) personal and professional development, (4) faculty/staff relations, (5) personal skills, (6) management responsibility, and (7) work habits. Finally, Singletary et al. (2004) investigated extension professionals' perceived skills to practice Public Issues Education, using a set of core competencies."

However, the model used in current research, as previously mentioned, comes from McLagan's HRD approach. Although this model is very common amongst educators and HRD specialists (see also O′Brien & Thompson, 1999; Stoof et al., 2002), this was its first application in a Middle Eastern, as well as Iranian, extension system. So, it is expected that the findings of this study can be used in further competency modelling in the field of extension. The same as any other kind of research, competency research has its own difficulties and the researchers attempted to combat them as much as possible. In the next section the pitfalls of the competency modelling research and the strategies used in this study to overcome them are given.

1.1.8 The problems and pitfalls in competency model research

Many challenges face competency modellers and competency researchers in the years ahead. Three important challenges both at present and for the future are described by Rothwell and Lindholm (1999, pp. 102-103). In this respect they contend that:

> "The first challenge has to do with ambiguous terms and definitions. Not everyone uses the terms competence, competency, competency identification, competency model, or competency assessment in precisely the same way. A common language does not exist. Secondly, competency models tend to be biased toward a past orientation. Examinations of exemplary performers have often focused on what they have done with an emphasis on the past to address critical incidents they face. The third challenge is that rigorous competency models remain time-consuming and expensive to develop."

Mulder (2001; 2007) gives a comprehensive view of the concepts of competence and competencies. He declares that one of the pitfalls of competency modelling research is dealing with these different conceptions and meanings between the terms competency and competence. He doubts that we should attribute the concept of competence to the UK and the

concept of competency to the US approach. He then declares that "given the wide variety in definitions, a legitimate question is whether there exists any coherence in the concept of competence" (Mulder, 2007, p6). Mulder, Weigel and Collins (2007) in their research examined this issue in the context of VET development in England, France, Germany and the Netherlands. They indicated that there are a variety of definitions used in the four research countries and stressed the many pitfalls in this regard. They finally contended that despite the complexities and variations in the concepts of competence and competencies, it does not reduce the importance of competence and competency modelling research. They underline that knowledge is not enough and competency is urgently needed to be able to use this knowledge.

Cunningham (2006, p4) similarly pinpoints another pitfall of the competence concept in competency modelling research. He says:

> "Organizations that want to be excellent also ask for excellent people (what human resource is now calling "talent"). If they say that a person is competent it can mean that the person is mediocre; they are acceptable but not excellent."

He concludes that "the challenge, then, for learning and development professionals is how we develop excellence". He also states that most competency lists do not have factors like trust and integrity; where, these issues are of great importance for the success of employees and their organizations.

Biemans et al. (2004) discussed a number of pitfalls in their research. They particularly concentrated on the problems of competence-based education within the context of VET. According to their findings, the following issues are the most important.

A) Different definitions of competence concept: as was already said there is little consensus on the meaning of competence among different researchers. They therefore suggest that a common vision of essential competencies must be given by involving as many actors as possible in the competency assessment process.

B) Over-reliance on standardization: relying too much on the standardization of competencies has made competency profile less applicable and more retrospective. This over-reliance on standardization causes competency modelling research to be more conservative and less innovative.

C) Difficulty of integration of school and workplace learning: competency modellers always underestimate the difficulty of this integration where many approaches to the competency development of learners are acquired in the workplace and not in schools. However, this issue should be reconsidered by researchers.

D) The necessity of determining learning activities and not just competencies: another problem in competency-based education research is focusing more on competencies and less on learning activities which are not necessarily covered by competencies. So, competence-oriented objectives should be translated to actual learning activities if they are to make sense for the learning process too.

E) Difficulty of the assessment of competencies: as already mentioned, competency assessment is labour-intensive and time-consuming. Additionally, preparing reliable assessment tools is both crucial and hard. All these issues make competency modelling research very difficult and expensive.

F) The need for changing the roles of teachers: in competency-based education the teachers are no longer responsible for knowledge transfer; rather, they are supposed to play guidance and coaching roles for learners. Nevertheless, this is often not considered by policy-makers.

G) Importance of competence-based management: competencies should not only be measured in terms of learning and education but also in management terms. In other words, the competencies of managerial boards (teachers and managers) should also be developed along with the competencies of learners because neglecting management systems will negatively impact the competency development of any other targeted group. In the next section the strategies undertaken to overcome the above listed pitfalls are described.

1.1.9 How the technical problems were tackled in this competency research

To tackle the difficulties of doing competency research in the current project the following steps were taken:

- First of all an in-depth review of international and national literature was carried out to clarify any ambiguities in the research and make the context and the concepts used in the study clearer both for the researchers themselves and for the audience (addressing the ambiguity in the definitions of competencies by all of the abovementioned researchers);

- The competency model was elaborated over several rounds and adjusted to the context of the Iranian extension system;

- The competency profile that was developed in this research aimed at future, rather than past or present, requirements. So, the results are applicable to the near future. This gives policy-makers the opportunity to organise the plans, funds and workforce needed for the next years in relation to AEIs and extension courses (addressing the comments of Rothwell and Lindholm, 1999);

- Special focus is paid to farmers with different demographic profiles as they are the most important audience for AEIs and therefore, the research started with them. Four different studies were carried out with farmers. Also, participant and non-participant farmers in extension courses were involved in the research;

- A wide range of perspectives was gained by involving various respondents such as farmers, extension managers, technical experts, and AEIs in the study in order to enhance the reliability and trustworthiness of the findings (addressing pitfall "A", Section 1.1.8, mentioned by Biemans et al., 2004);

- Both interviews (with farmers) and postal survey questionnaires (for experts) were utilized as research tools in the study and their reliability and validity were tested;

- Quantitative data analysis was carefully used and, when possible, qualitative interpretations were applied in the research;

- In the competency profile, the competencies of AEIs (their expertise) were categorized on three different levels (low, average and high) to address the comments of Cunningham (2006) and to distinguish the rate of competencies needed for AEIs in the proposed competency profile;

- The benefit of achieving close cooperation with the MAJ increased the response rate and justified the research to a greater extent for experts, farmers and other respondents;

- Involving not only farmers and AEIs in the research but also different levels of managerial boards in the MAJ engaged managerial boards in the study (addressing issue "G", Section 1.1.8, of remarks of Biemans et al, 2004).

1.2 Problem statement

In this section, attempts are made to clarify the major problem that this research is going to address. To begin with, we describe the general status of HRD in the agricultural sector of Iran, the kinds of supports that Iranian farmers need, agricultural extension services (AES) and organizations, the problems they are struggling with, the pitfalls and challenges ahead, the status of AEIs as the target group of the research, and the courses they teach. Finally we will contend that the competency development of this group is essential and consider the best course of action to ensure their professional development.

1.2.1 Status of HRD in the agricultural sector of Iran

As was noted earlier, the agricultural sector, due to its unique characteristics, generally plays a critical role in most developing countries such as Iran. This sector is not reliant on very complex and expensive technology; it is flexible; work in this sector can be carried out by lower educated people, and it does not require a huge investment. All the abovementioned characteristics are important for the economy of a country like Iran that has great agricultural potential and natural resources. Agriculture, on the other hand, has its own difficulties; for instance, it is very risky and influenced by many variables such as the weather, governmental rules, market demand and supply chain, plant and animal diseases, etc.

In Iran, many researchers have studied different aspects of HRD in the agro-business sector. They have looked at the many problems and endeavoured to find possible solutions to improve the situation. Most of these researchers have tried to integrate certain facets of HRD in the agricultural field and particularly agricultural extension and education (e.g. Tahmasebi, 1998; Darvishi, 2003; Karshenas, 1994; Foltz, 2002; McLachlan, 1988; Khatoonabadi, 1999; Afkhami, 1998; Kalantari, 1995; Karami & Rezaei-Moghaddam, 1998; Bageri & Shahbazi, 2003; Lotfi, 2004; Heidari, 2000; Amirani, 2001; Karami, 1995; Karami & Torkamani, 1992; Pezeshki-Raad & Aghai, 2002; Pezeshki-Raad, Aghai & Ukaga, 2001; Chizari & Mirikhoozani, 1995; Mohseni, 1994). In the field of agriculture, such as other domains, to be effective, HRD needs to be conducted by HRD professionals who themselves are sufficiently competent. A number of studies have been conducted and revealed that no sufficient efforts have been made in HRD and HRM (human resource management) in the agri-food sector of Iran; moreover, these researchers have not pursued parallel goals and therefore yielded findings

of little mutual benefit (e.g. Karami, 2001; Najafi, 1991; Pezeshki-Raad, Yoder & Diamond, 1994; Chizari, Chizari, Karbasioun & Linder, 1998; Zarafshani, 2002; Pezeshki-Raad & Aghaei, 2002; Karbasioun, Mirzaey & Mulder, 2005). Therefore, additional intensive HRD research is needed in order to address the development of different facets of the agricultural sector as well as farmers, input-suppliers, output-buyers, technical experts, extension personnel, managers and so forth.

1.2.2 Support Iranian farmers need

In terms of the kind of support Iranian farmers need and expect from extension services, nearly all studies in the past (above sources) have confirmed that farmers need help both in the technical activities (cultivation, irrigation, plant protection, animal keeping, harvesting etc.) and also in the general aspects (communication, management, marketing, administration, innovativeness etc.) of farming. In terms of the educational supports, both technical and general, the studies of Van der Bij et al. (2003) and Paavola et al. (2004) can shed more light on farmers' learning styles and the importance of considering learning as a complex and interactive phenomenon which needs careful attention. The kind of support varies based on the level of education, income, forms of activities, and age level of farmers. For instance it was discovered that older and more poorly educated farmers and small-holders are more likely to need support in their farming activities and in their working life as a whole (Mirzaei, 2004).

Torkamani and Hardaker (1996) carried out research in the province of Fars in Iran and reported that risk aversion plays an important role in farmers' behaviour. They underlined the need for farmers to be supported and educated through risk-mitigating strategies such as the provision of more reliable farming technologies or insurance funds. They also stressed the supports farmers need to overcome marketing difficulties, and price instability of agricultural inputs and products. They additionally need to be helped to deal with abrupt climate change such as drought, earthquakes, and floods. However, recognition of the different supports that farmers need is of great importance for developing a competency profile of AEIs (Agricultural Extension Instructors). Consequently, these supports are assumed as the indicators of the competencies needed by AEIs in different studies of farmers in this dissertation (chapters two to five).

1.2.3 Status of Iranian agricultural extension services (AES)

The Iranian AES was established in 1953 and, like all other administrative organizations in Iran, has been influenced by changes in governmental policies. In 1964, the "White Revolution" introduced by the Shah of Iran had a primarily negative impact on farmer development and agriculture.

The "White Revolution' was a package of policy guidelines designed to facilitate the transition from an agrarian to an industrial, modern economy. The main component of the package was an attempt at land reform imposed by the central government. This was an effort on the part of the Shah to prevent any possible peasant uprising. The reason it was called the White Revolution was that it was meant to be a revolution without bloodshed, since it was formulated by the Shah and not by a mobilised populace (Bahramitash, 2003). Until 1964, Iran was self-sufficient in food production, but gradually had to import food subsequent to the implementation of the White Revolution. As a result, extension agents were perceived as less effective, and they themselves lost motivation. Nevertheless, various extension programs such as Rural Islamic Councils, Co-helpers, Construction (Sazandegi) groups, Rural Youth Clubs, and extension courses continued to be implemented by AES (Heidari, 2000; 2001). Similarly, Amirani (2001) declared that AES in Iran, with a history of more than fifty years, has still not been able to reach and support all potential clientele. Hence, the government has endeavoured to explore the best extension approaches and strategies in order to improve the efficiency of AES and support farmers by applying those farmer friendly strategies. The overall hierarchy of the agricultural extension system in Iran is outlined in the next section.

1.2.3.1 The hierarchy of agricultural extension in Iran

The agricultural extension system of Iran mainly follows the governmental (common) agricultural extension approach and performs various activities on three different levels. Chizari and Mohseni (1999, p. 28) and Mirzaei (2004, p. 84) investigated the situation of agricultural extension in Iran in their research. They elaborated the following three levels for AES:

• *National level*: At the national level the Ministry of agriculture is responsible for all extension services. This Ministry has nine departments and employs about 7300 higher level staff in Tehran; 2300 are involved in research, 80 in extension, 90 in training, and the rest in

other areas. Even though the budget allocated to extension has increased steadily every year staff numbers clearly illustrate the shortage of extension and education staff in the Ministry; a typical problem of the AES.

• *Provincial level:* the provincial Director General (DG) for agriculture is responsible to the Extension deputy minister for all agricultural affairs in each province, including Esfahan. The Director of Agricultural Extension (DAE) is appointed by the DG of the extension organization in Tehran. The DG in Tehran is responsible for the annual budget and programs; nevertheless, the DAE has the authority to implement programmes in, and cooperate with, other organizations at the provincial level.

• *Local level:* at the township and village level, there is a director of agriculture in each township. The director has a general deputy who is in charge of the extension director. At the village level there are a total of about 800 agricultural extension service centres in Iran. Mirzaei (2004) elaborated on the role of these extension centres at the local level. He stated that in these centres it is assumed that all farmers' affairs and problems are addressed. They should provide agricultural input delivery, consultancy and problem solving, presentation of extension courses, regular visits to farmers and, in general, help farmers in all aspects of their profession. The philosophy is that the personnel of these centres can establish constant and close contacts with farmers and also act as mediators between farmers and extension organizations at the township and provincial level. Generally, the head of these extension services is educated to a Bachelor Degree level; usually a Bachelor of Science Degree in the agriculture field or preferably extension science. There are also four to five assistant technicians working in these extension centres who get paid by the ministry of agriculture (MAJ).

1.2.3.2 Lack of effectiveness of AES/AEIs; a serious concern

Agricultural extension is a public service for human resource development in the agri-food sector, including farmers (Van den Ban & Hawkins, 1996). AES are assumed to support the workforce involved in the agriculture field. The size of the workforce in Esfahan is 1.1 million, of which 14.5% work in agriculture. Most of these workers live in rural areas, and are educated only to primary level. Previous research has shown that different personnel of the ministry of agriculture (MAJ) as well as AEIs have had problems playing their expected roles with regard

to farmer development and support. Earlier studies in Iran (Chizari, Karbasioun & Linder, 1998; Mirzaei, 2004) showed that there are still difficulties, barriers, misunderstandings, and weaknesses in the transference of new technology and information from AEIs to farmers. The issues are mainly HRM and HRD related which scientists in both fields have attempted to address (Lucas & Diener, 2003; Price, 2004; Walton, 1999; Smith, 2003). To have a better understanding of this subject, the problems that negatively impact the function of extension organizations in Iran will be discussed in the next part.

1.2.3.3 Problems and pitfalls of extension organizations in Iran

According to an in-depth meta-analysis by Karbasioun and Mulder (2004b), major problems and pitfalls of extension organizations were categorized into three different areas: A) HRD (human resource development), B) HRM (human resource management), and C) OD (organizational development) issues. These issues are discussed below.

A. HRM problems and extension organizations in Iran

In sum, the most common HRM problems in Iranian extension organizations can be described as follows.

A.1 Shortage of extension personnel

The shortage of extension employees, including extension educators, experts, and agents, is one of the reasons that extension services have not been able to reach a large number of potential clientele (Pezeshki-Raad & Agahi, 2002). However, this does not mean that there is a shortage of available human resources. On the contrary, Iranian organizations generally have large numbers of applicants for any positions offered. The dilemma, therefore, is a shortage of allocated funds and financial support to recruit new personnel. There is also a lack of expected competencies among these available applicants; these will be discussed later. Although extension organizations are expanding their numbers of professional staff, fiscal limitations have hindered them from fulfilling their new personnel demands (Pezeshki-Raad, Yoder & Diamond, 1994).

With the aim of dispelling the shortage of human resources in the extension sector, the MAJ has already utilized various new employees including key farmers, rural leaders, and extension assistants. Likewise, a number of graduates and those with higher school certificates during

their military services have also been hired to support other stakeholders in the field (Statistical Centre of Iran, 2001b).

A.2 Problems in recruitment

Another obstacle with HRM in extension organizations is that the recruitment and selection of new employees is not appropriately tailored to current and future job requirements. Thus, there are some parts of organizations that are over-staffed, while some others are faced with shortages of suitable and specialized employees (Chizari, Karbasioun & Linder, 1998).

A.3 Lack of adequate mobility in extension organizations

The use of inflexible pedagogical approaches in extension system programming has additionally decreased the willingness of farmers to rely upon extension activities. As a result, extension organizations are generally perceived as a secondary source of information for farmers (Chizari, Lindner & Lashkarara, 2001). Although policy makers and program planners in the Ministry of agriculture (MAJ) have emphasized and increased the flexibility of extension programs (and have achieved remarkable success in recent years), they continue to suffer from inertia. Extension practitioners or employees who are not sufficiently familiar with adult learning principles and extension philosophy also generate these stoic pedagogical approaches. A study conducted in the south-western Fars province of Iran supports this idea. This survey discovered that existing technical approaches to research and extension services are an inefficient way of bettering farming systems, particularly for small farmers (who make up the majority of this group in Iran). The researchers suggested that adjustable and flexible extension and research programs would improve the understanding of complex farming systems, and effectiveness of relevant activities (Karami & Torkamani, 1992).

A. 4 Low levels of employee motivation and accountability

In general, employment in extension centres has negative psychological and social connotations. The low income at all employment levels has significantly diminished motivation amongst extension professionals (Hejazi, 1989; Najafi, 1991). However, in comparison with extension organizations, it can be stated that better conditions exist within agricultural

universities and schools. For instance, research has revealed that employers are satisfied with the knowledge and abilities of extension graduates. Nevertheless, this research still shows that those agricultural extension students and graduates, as well as the university chairperson and faculty members, are not commensurately satisfied with the general situation of the agricultural extension departments of their university (Hejazi et al., 2000).

Furthermore, Amiri and Zamani (1999) investigated the factors that influence the commitment of agricultural graduates of Shiraz University in Iran to extension organizations. They discovered that employment failure has a negative effect on organizational commitment and no correlation was observed between academic success and organizational commitment. These findings clearly show that a lack of employee motivation and commitment can be produced by job dissatisfaction, particularly emotional and psychological unhappiness.

In this respect, research was implemented to assess the factors that intervene in the positive motivation of extension experts in the northern provinces of Iran. The findings supported the aforementioned idea and introduced a number of variables that diminish the motivation of extension personnel. These factors include undesirable performance evaluation, low levels of participation in the decision-making processes, lack of positive and constructive competition, and the perceived low position and prestige by the majority of people of the job held (Yadavar & Pezeshki-Raad, 1998).

Comparably, Kamalian and Khandelwal (1999) carried out a study amongst Iranian managers in relation to values and organizational climates. In this research, they pointed out that a lack of motivation and, particularly managers' incentives, has a significant and direct relationship with organisational climate and circumstances. Kamalian and Khandelwal (1999) believed that an organisational atmosphere must rigorously support employees' needs, values, and expectations, if they want to retain active employees who are willing to work independently.

Additionally, the prevalence of top-down authority patterns in extension organizations has caused low job satisfaction and motivation amongst its employees. However, it must be noted that policy making has recently become more active with a bottom-up management process (Chizari, Lindner & Mohsanie, 2001). Nonetheless, Sadighi (2003) showed the persistence of the top-down approach in his recent survey of 478 extension professionals in four provinces of Iran. He declared that some of the common shortcomings of conventional extension organizations found in many developing countries (such as Iran) are the highly bureaucratic and ineffective organizational structures. He suggested improving existing management

systems and shifting from an employer-oriented (industrial-age) towards an employee-oriented (knowledge work) approach as a solution to enhance the professional satisfaction of extension staff. Furthermore, the focus of attention on fiscal and physical supplies over human resources also reduces employee motivation. One of the reasons behind this impression is a high rate of unemployment and the intense job competition (United Nations, 2003).

B. HRD problems of extension organizations in Iran

The most remarkable HRD problems in extension organizations are listed below.

B.1 Inadequate extension employee professional competencies

The lack of necessary professional competence among extension staff, as well as extension agents, is another important barrier for HRD and HRM in the extension system of Iran. As a result, extension staff have come to be perceived by the public as less effective and consequently they became disillusioned (Pezeshki-Raad, Yoder & Diamond, 1994).

However, the lack of desired HRD in extension systems is not a novel concern. Looney (1977) underscored the lack of a proper level of competency among extension personnel and its severe restrictions on government efforts for agricultural development before the Islamic revolution in Iran. Accordingly, Karbasioun (1998) iterated that the general low competency level of agricultural graduates stems, to some extent, from inefficient teaching methods in higher education in Iran. He proposed to pay more attention to more active and practical educational techniques, rather than the traditional dogmatic banking methods.

Correspondingly, another researcher assessed the qualification and competency of extension graduates at the BSc level in different provinces of Iran. The findings exposed that graduates have a moderate level of the required theoretical information and diversely low capabilities in leadership, management, and establishing effective relationships with other organizations (Azadvary & Pezeshki-Raad, 1997).

The same research was accomplished in Esfahan, with the aim of identifying and prioritizing educational needs and determining the competencies needed by extension practitioners. The results of this study revealed the five highest ranked educational needs of extension agents as: extension philosophy, instructional technology, innovation and adoption process, adult

education, and extension methods. Additionally, respondents of this study expressed that the major support they needed was availability of subject matter specialists to help them with technical and communication methods (Baygi, Zarafshani, & Chizari, 2000).

Furthermore, another survey was implemented amongst instructors who teach farmers in agricultural education centres in Iran. This research found that a group of instructors who participated in "in-service education" were remarkably more self-confident and successful than the control group. As a result, the effectiveness and competency of employees significantly increased by providing suitable and necessary educational programs for extension personnel (Blader & Naderi, 1998).

B.2 Problems in training programs

Both pre-service and in-service training programs play a critical role in reinforcing staff capability, as well as renewing their skills (Chizari, Lindner & Karbasioun, 1998). A survey was carried out in agricultural extension organizations in the Mazandaran province of Iran, where participants in In-service courses were asked to fill out questionnaires. The results showed that they perceived these courses to be of a moderate level and propounded the following factors as obstacles and difficulties in the courses: insufficient welfare facilities; focus on the theoretical and not on the practical aspects of education; unsuitable course locations; and low competency and capability of instructors (Shahani & Sedighi, 1997; Chizari, Karbasioun & Linder, 1998).

B.3 Insufficient employee access to new learning and communication technology

At present, computers and Internet connections are seen to be two important tools for accessing the newest information and providing the means for communication with researchers, scientists, and professionals around the world. More and more organizations believe this fact, and are attempting to provide this valuable technology for their staff. Due to financial restrictions, extension organizations in Iran have not been able to supply this equipment for a large number of their employees. Therefore, this problem is deemed to be another impediment for HRD in extension institutions. Sometimes personnel who posses these tools do not have the skills to use such equipment in the best manner or do not have sufficient time to continually use them (ISNAR country report R6, 1999).

C. OD (Organisational Development) problems and extension organizations in Iran

The problems and difficulties that are mostly related to OD are outlined below.

C.1 Structural changes in the Ministry of Agriculture over the last decade

One of the important factors that have significantly influenced extension in Iran is the structural change within the Ministry of Agriculture over the last decade. The decentralization of duties of the two Ministries responsible for agriculture (The Ministry of Agriculture and The Ministry of Jahad-e-Sazandegi (reconstruction mobilization) and their recent merger (now known as the Agricultural-Jihad or MAJ), has resulted in many visible and invisible bilateral (negative and positive) consequences that should be assessed (Ministry of agricultural-Jihad, 2002). This issue has had significant effects on the way that HRM/HRD has been organized and handled as the constant changes in organizational strategies, duties, expectations and concerns has inevitably influenced all human resources in the ministry.

To clarify this, Hosseinnejad (2001) analyzed the organizational culture of the Ministry of Agriculture and the Ministry of Jahad-e-Sazandgy (two former Ministries). He compared these cultures and explored that there are a number of cultural differences between these two organizations. He stated that adapting their activities together in a coherent structure is a time-consuming and difficult task, which requires patience. In order to alleviate internal conflicts in the new Ministry, he proposed that it would be necessary to redesign and reconstruct another sustainable organizational culture with regard to long-term program planning. He proposed more studies to expose all the different perspectives of the new Ministry.

C.2 Lack of adequate linkage between extension and other institutions

Lacking the sufficient linkage between extension and other organizations has also influenced HRD in extension systems in Iran and has been an obstacle for extension services (Pezeshki-Raad, Aghahi & Ukaga, 2001). In relation to this, descriptive research was conducted to assess the perceptions of faculty members at the agricultural college of Shiraz University, in the Fars province of Iran. The results revealed that there are insufficient linkages between local agricultural affairs and researchers who are working in universities or other research centres.

The researcher therefore offered recommendations to strengthen the interactions between extension and research institutions (Zamani, 2000).

Furthermore, a related study carried out amongst agricultural researchers in the three Iranian provinces Isfahan, Khozestan and Cheharmohal-o-Bakhtiari, uncovered that general contact between extension employees and researchers is not high. The findings also showed that there is weak communication between researchers and farmers. Therefore, the majority of agricultural studies implemented are of little relevance to farmers in real situations (Karami-Dehkordi & Pezeshki-Raad, 1997). This fact was similarly confirmed by Pezshki-Raad (1993) in his study of the necessity of establishing relationships between universities and agricultural extension centres. He concluded one of the major difficulties in developing extension services in Iran from its conception in 1952 to the present, is the sector's low mobility and dynamism.

C.3 Inadequate Farmer Participation in Extension Organization Programs

Despite the apparent cooperation of farmers, many extension programs do not appropriately fulfil their original expectations. To ensure genuine cooperation in extension programs in developing countries such as Iran, farmers should be actively involved in the initial planning procedures as well as in their execution (Moczarski, 1978).

MacLagan (1983; 1989; 1996; 2000), who introduced "models for HRD practices," also noted this fact in her article as a general context for HRD work. She believes that HRD professionals, in both formal and informal organizations, can be the architects of change. They can work with their leaders to establish a participative, high performance philosophy for the people part of their businesses by automating as much of the routine HRD work as possible.

A national study regarding sustainable extension systems in Iran showed that approximately all of the 350 professionals that participated in the survey emphasized participatory approaches and more focused attention on farmer involvement in hiring key-farmers, innovators, and rural leaders (Amirani, 2001). The lack of participation, combined with low agricultural incomes has made young farmers reluctant to continue the cultivation of their forefathers' lands (Agasizadeh & Shahbazi, 1995). A subsequent assessment of farmers' information in south-eastern Iran (Azarbayejan province) revealed that the majority of farmers had low information input scores. In order to explain the factors causing this low level of information input, the

researcher explored a significant relationship between all independent variables of the research. These variables were: information output, inter-system communication, farmer-researcher communication, family education levels, and availability of input facilities (Rezvanfar & Vaisy, 2003). Although agricultural extension organizations have not been highly successful in reaching all groups on farmer participation they have, however, focused on encouraging farmers to voluntarily take part in the most relevant programs. Therefore it can be seen that extension in Iran has not been obliged to embrace a more participatory approach towards its programming (Zarafshani, 2002; Sedighi, 2003).

Similarly, Karami (1995) showed that extension organizations mostly concentrate their efforts in villages with larger and more developed farms that are, to some extent, nearest the rural service centres. Although the support of larger farmers (with a higher income and production level) has had a positive effect on productivity and agricultural progress, the fruits of this innovation have not been shared by all. In fact, many farmers continue to live in poverty. Therefore by neglecting the majority of poor farmers, extension organizations have negatively influenced farmers' motivation towards sustainable agriculture in the long-term (Karami, 1993; 2001).

1.2.4 The status of instructors (AEIs) and their position in the MAJ

In the field of agriculture there is always a gap between the knowledge and skills of the various personnel involved in AES; there exists the knowledge and skills of instructors, facilitators, consultants and advisors on the one hand and the demands and expectations of farmers on the other. Although academic preparation amongst extension professionals can enable them to acquire expert positions in the MAJ they often lack the opportunities to obtain the sufficient skills to be truly successful (Gibson, 2002). Beijaard (1994) tried to address the following in terms of the knowledge and skills gap: "what competent teaching implies, what everybody teaching practice looks like and which perspectives can be offered to increase the quality of instructors' professional lives?"

To address these facts and their difficulties in communication, teaching, motivation, being up-to date, and possessing relevant experience and adequate extension knowledge AEIs were selected as the target group of this research. AEIs additionally play a critical role in farmer

development in the agri-food sector. Furthermore, large quantities of time and financial resources have been spent on extension courses during the last two decades; nevertheless, these courses are rarely perceived as effective by many authorities. Different research has been conducted to augment the situation by recruiting competent AEIs and supporting them with the provision of: proper training programs and self-study materials, increasing their motivation, enhancing the instructional facilities in extension courses, organizing AEIs' associations, and holding pertinent conferences, seminars and workshops. Nevertheless, evidence shows that the problem still exists and needs to be addressed (see Karbasioun & Chizari, 1995; Chizari & Mirkhoozani, 1995; Chizari, Karbasioun & Linder, 1998).

Collectively, there are about 3.5 million farm families working in the agricultural sector, and only about 2,700 agricultural extension instructors engaged in agricultural development who are co-operating with the Ministry of Agricultural-Jihad (MAJ). These instructors are distributed across 28 different provinces of Iran. On average, approximately 100 individuals, of which the vast majority are males (about 85%), are working in each province and this number does not take increasing farmer demands into account. The characteristics of AEIs can be listed as follows (The Ministry of Agricultural-Jihad, 2004):

- They are teaching in the informal agricultural education system.
- They work as part-time employees.
- They are originally subject matter specialists who are full-time employees of the agricultural ministry or other relevant organizations or even of private companies in which agricultural instruction for farmers is their additional activity.
- The majority of the instructors have a BSc degree, a minority have a PhD However, other educational qualifications like technical education and MSc can also be found in this group.
- There is a wide disciplinary diversity in their field of study (horticulture, agronomy, husbandry, natural resources, etc); in other words, it is a multidisciplinary population of professionals in agriculture.
- As a rule, more experienced persons should have more opportunities to teach courses each year.
- After the courses, an evaluation of the implementation and usefulness of the course and instructors is carried out, but the results are not effectively utilized for the future.

- In theory the less successful and capable instructors should be eliminated and not invited for subsequent courses. But because of shortages of experts in different townships agricultural extension organizations are forced to draw from a limited pool of available experts.

- Most of the instructors carry out only one or two projects per year.

- They are temporary but recurrent instructors in the field of agriculture.

- The agricultural ministry is responsible for training the instructors.

- On average, one meeting or workshop is conducted each year for training instructors, to expand their teaching and communication abilities but there is no pre-test and post-test evaluation of a participant's performance.

- Universities occasionally support training programs, additionally programs are offered by the Ministry of Agricultural-Jihad (MAJ) or other ministries.

1.2.5 The courses instructors (AEIs) teach

The courses AEIs present are based on different disciplines such as dairy farming, cattle and sheep rearing, apiculture, sericulture, floriculture, poultry farming, principles of building animal stables, industrial cattle rearing, safeguarding of environment and natural resources, utilizing rangelands and pastures, agricultural mechanization, carpet knitting, and rural handicrafts and artefacts. Although, it is possible to double the production yield and also increase the rate of employment to about 10% every year by educating farmers, on average, each employed villager (man or woman) only has access once every thirty years to these extension courses (Mirzaei, 2004). When considering the predominant role of extension courses in job and competency development of farmers, the quality and the quantity of the courses must be notably increased (Karbasioun, Mulder & Mirzaei, 2005). Therefore, this limited opportunity to attend extension courses is a problem that the authorities must seriously resolve. Generally speaking, these courses have the characteristics as listed below:

- They are short-term courses, which are always offered to farmers over one week or less, mostly in winter when farmers are not busy with their work;

- These courses are practical, based on farmers' needs, interests and demands;

- They are not aimed at a formal qualification; they are for helping farmers to improve their farming methods; irrigation, cultivation, protection of plants, harvesting, and marketing; and subsequently acquire more income;

- Classes are limited to 25 people varying in age from 15 to 50 years of age; but this rule is often neglected because of lack of sufficient candidate farmers for participation in the courses;

- Training usually takes place in mosques and schools and other public locations in the villages;

- The extension organizations in the townships are requested to provide necessary audio-visual instruments and facilitate the learning process but such instructional tools are often not used or are not feasible for AEIs;

- Taking part in these courses is free of charge and the MAJ is responsible for all costs of these courses such as the payment of instructors, entertainment, and instructional material.

1.2.6 Toward professional development of AEIs

As has been frequently stated, the major aim of this thesis is to develop a competency profile for AEIs. In the literature much can be found about professional development of personnel in organizations as well as managers, researchers, marketers, and instructors. In this part, we will examine previous studies on the topic with a focus on AEIs in a wider framework to see the approaches that others considered to tackle this phenomenon in a wider context. For instance, Carnevale, Gainer and Meltzer (1990) recommended seven competencies that are necessary for those who want to be employed in any kind of organization. He named them "basic skills" in the sense that employees in any organization, regardless of its size, ownership, or activities, must have them. These competencies are learning how to learn; basic skills (reading writing, computation); communication skills (speaking and listening); adaptability skills (solving problems and thinking creatively); development skills (self-steam, motivation, goal setting, and career development); group effectiveness (interpersonal skills, teamwork, negotiation); influencing skills (understanding organizational culture, leadership).

In the field of agricultural extension, educational work constantly changes in order to meet the needs of clientele. Faculty and staff must help identify the knowledge, skills, and behaviours they will need to get the best results as well as the skills and functions that are no longer

effective. This makes the significant role played by extension instructors in identifying and then assessing their level of skill evident. Competence development helps them to build organizational commitment and trust effectively (Stone, 1997).

Because of the low level of competencies obtained through external recruitment, many businesses and organizations, including extension, are identifying and training internal candidates for all of their vacancies, particularly managerial positions. The basic tenet is that successful employees are successful because they acquired competencies in one or more occupational fields and excelled at applying those competencies (Lindner, 2001).

The role of the extension agent has also changed over time, and the number of competencies identified for agents has increased. In the future, the success of extension programs will be determined, to a large degree, by the ability of the Co-operative Extension Service to keep highly qualified agents as well as AEIs. Hence, in his (Lindner, 2001) research, the competencies which are necessary for an extension agent to be proficient, were categorized by a panel of experts as program planning, implementation, evaluation; public relations; personal and professional development; faculty/staff relations; personal skills; management responsibility; and work habits.

Stone (1997) believes that extension employees, as well as AEIs, must have increased technical competencies in more than one program area such as competencies across the entire organization, within job families and program areas (extension agents, specialists, consumer and family sciences, 4- H/youth development, agriculture and natural resources, etc).

Obinne (1992) in his study in Nigeria asked extension instructors about their competencies. Within this inquiry they rated themselves on their performance level in the subject matter of agriculture as well as in their teaching competences. Surprisingly, about 50% of the respondents rated themselves low on subject matter and on performance rating for teaching.
In their study, a significant correlation measured, and showed, that as the facilities available for extension teaching/instruction become more adequate, instructors use such resources more frequently. A correlation matrix showed a relatively high, positive correlation between subject-matter competence and extension teaching activities competence.

Another study (Gonzalez, 1982) was carried out to recognize the occupational competences of extension facilitators. The researcher identified 144 competencies needed by extension facilitators in Pennsylvania. Of these competencies, 26 were identified as appropriate for development before entering the job, 6 during a graduate program and the remaining 113 through in-service education. Ayewoh (1983) reported similar findings for extension agents in Nigeria. Thereafter, conversely, Ongondo (1984) performed the same research in Kenya and identified a number of competencies lacking in the target group. They, therefore, concluded that for a majority of the extension agents, competencies should be developed before entering the job; nevertheless they can be developed through in-service education.

Lolley (1980, pp. 47-51) cited a number of competencies that are necessary for technical and vocational instructors. He listed these competencies as:

> "Ability to use a variety of instructional techniques; communicate effectively with learners and colleagues; cope with a variety of learners abilities and interests, ability to motivate learners; ability to establish joint seminars, discussion sessions etc; capability to conduct researches which would serve the objectives of training programs; willingness to apply new teaching and assessment methods and the ability to review, monitor and develop curriculum."

He also believed that instructors at the vocational and technical institutions must possess specific skills before employment. The international board of standards for training, performance, and instruction (1988) has identified ten competencies for instructors. According to this board an instructor should be able to: establish and maintain credibility; demonstrate effective presentation skills; assure preparation of the instructional site; use media effectively; evaluate learner performance; evaluate delivery of instruction; demonstrate effective communication skills; report evaluation information; provide positive reinforcement and motivational incentives; demonstrate effective questioning skills and techniques.

Another analysis was conducted in the college of technological studies in Kuwait and Saudi Arabia (Ali, 2003) about the competencies of VET instructors and discovered that selected instructors lack some general and technical competences such as managing and encouraging the group discussion sessions, ability in transferring the right skills, and the use of real case studies in both countries. Moreover, instructors distinguished the competencies that are the most important influencing skills in their careers; the use of computers; writing research papers; and knowledge of adult learning theory. Those instructors were enthusiastic about

attending training programs on the above-mentioned titles. Van den Ban (1996) declares that helping extension officers to improve their ability is an important objective in extension training programs.

Finally an exploration was carried out in the province of Esfahan of Iran to identify and prioritise the educational needs of extension instructors and the competencies they should posses to be successful in their job. Results indicated the five most highly ranked items on educational needs of extension instructors were extension philosophy; instructional technology; innovation and adoption process; adult education; and extension methods. The instructors asserted that they would be able to effectively play their teaching role if their educational needs were satisfied. Additionally, respondents indicated the major supports needed were the availability of subject matter specialists to help them with their technical and communication methods (Beygi, Zarafshani, & Chizari, 2000). McLagan (1983) identified three main categories of competencies which are technical, business and interpersonal competencies. She (1989) introduced a complete list of outputs, quality requirements, competencies, ethical issues and future forces for different roles in her model. After several inquiries with a variety of experts, she eventually presented the following 14 competencies for an instructor: adult learning understanding; coaching skills; feedback skills; group process skills; intellectual versatility; objectives presentation skills; observation skills; performance observation skills; presentation skills; questioning skill; relationship building skill; self-knowledge; subject matter understanding; training and development theories and techniques understanding (Models for HRD practice book, 1989, p. 56). These competencies were used in this research as the basis for the first version of the competency lists.

Therefore, McLagan's research, mentioned above, and the other studies alluded to so far formed the basis for the primary version of the competency profile of AEIs prepared here. The first version emerged mainly in the questionnaire of the key study of the PhD project (chapter eight) and also partly in other parallel studies. In other words, the original competency model proposed by McLagan (op. cit.) was structurally adjusted to the situation of AEIs in the current study; many items were changed or revised to bring about a more compatible model questionnaire to be used in the empirical part of the research. Thus, it could be said that the movement towards the professional development of AEIs started through the development of their competency profiles.

1.3. Research design

In this part, attention will be paid to the general research objective, research questions, research strategies, research tools, research analysis and key concepts of the study.

1.3.1 General objectives and research questions

The principal objective of this project is to develop a theoretical framework and, as a result, a competency profile for AEIs in the next 3-5 years. Therefore, based on the HRD model developed in the studies of McLagan, the general research question of this PhD project is formulated as: "*what kinds of competencies are needed for AEIs in the near future (next 3-5 years) to be able to act appropriately in their role as instructors?*"

The three main research questions (A, B, & C) and their sub-questions are:

A. What roles do farmers perceive that AES (Agricultural Extension Services)/AEIs (Agricultural Extension Instructors) currently play in AD (Agricultural Development) and farmer development in Iran? *(Addressed in part I: chapter two to five)*

A.1 In the view of farmers:

- What are the most important information sources (IS) and coping strategies (CS) that farmers use to deal with changes on their farms?
- What kind of extension and training programs are available to support farmers?
- Who is delivering these programs, who are their recipients, and what are their strengths and weaknesses?
- What are the effects of these programs on farmers' competency development? Do they have added values for farmers?

A.2. What are the implications of the findings of farmer studies for a competency profile of AEIs in the next 3-5 years?

B. According to the experts, what are the policy developments in the field of agriculture (AD) and agricultural extension (AES) in Iran and what are their implications for a competency profile of AEIs? (*Addressed in part II: Chapter six and seven*)

B.1 In the view of agricultural experts:

- What have been the AD/AES changes in Iran over the last decade? Are they positive or negative and to what extent?

- What were the most important AD (AES) problems in Iran over the last decade? Which ones will remain important for the next five years? Moreover, what priority is given to the consideration of problems in the next five years?

- To what extent has the Ministry of agricultural-Jihad (MAJ) addressed AD/AES problems so far and is the MAJ able to solve the problems alone?

- What organizations or agencies are delivering agricultural training programs for farmers and how useful are they?

- What are the relationships between experts' personal traits and the AD/AES issues and problems illustrated here?

B.2 What are the implications of the findings of this study for the development of a competency profile of AEIs?

C. What are the competency profiles for various roles of AEIs in Iran? (*Addressed in part III: chaptes eight and nine*)

C.1 In the view of technical experts, managers and AEIs:

- What are the important future forces for agricultural instruction?
- What are the main outputs for each role of AEIs?
- What quality requirements are essential for producing and delivering each output?
- What are the competencies needed for AEIs in the next 3-5 years in Iran?
- What ethical issues are important for the roles of AEIs in the next 3-5 years in Iran?

With regard to the research questions, the project combines a range of perspectives, which are assumed to influence the core of the study (developing a competency profile for AEIs) in Iran. Therefore, we start with farmers and their opinions to examine the role of AES (question A) in

Iran. Through this it is also intended to investigate the changes (positive or negative) that farmers have experienced; information sources, and the coping strategies they used to overcome those changes.

Organizations involved in farmer training, their fruitfulness for farmers and the rate of cooperation with each other, are also examined. Thereafter, various experts in the field of agricultural development and extension are investigated (question B), which is agricultural policy analysis.

In the second part of the research, it is aimed to explore either the problems that hinder or the initiatives that accelerate AD and AES in Iran. The final, and key, research question of this project (question C) directly focuses on a competency job profile of AEIs that comprises different elements (future forces, outputs, quality requirements or standards, competencies and ethical issues) for the next 3-5 years.

The whole project should benefit a wide perspective of respondents and will take different target groups' opinions into account in order to develop a reliable competency profile for AEIs in the future; although, the model can also be applied in the short-term.

1.3.2 Research framework

As it was said earlier, this research is founded on farmers as the core study group. Then, agricultural experts' opinions are examined to discover the status of agricultural development (AD) and agricultural extension services (AES) and its various programs for the last 10 years.

Finally the focus is to be on the perceptions of experts, managers and AEIs in the ministry of agriculture (MAJ) about the future forces, roles, outputs, ethical issues and competencies of AEIs in the next 3-5 years. It is expected that this multidimensional approach to the research helps to increase the authenticity of the findings. This triangulation can be demonstrated in the following figure 1.2.
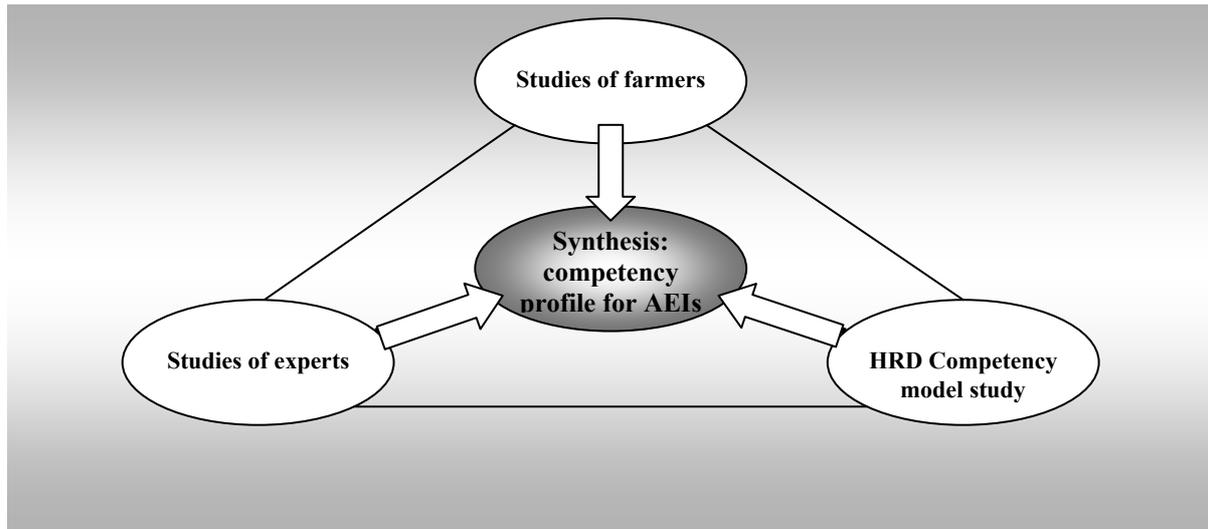
Figure 1.2 Relationships between the different studies within the PhD project with the key project objectives

1.3.3 Research strategy

In this research, the "survey" was selected as the basic method. Verschuren and Doorewaard (1999, p. 149) describe surveys as "a type of research in the course of which the researcher tries to gain an overall picture of a comprehensive phenomenon spread out over a period of time and space". They also outline the characteristics of survey research as: "large numbers of research units; labour extensive data generation; more breadth than depth; a random sample; quantitative data and analysis; and preferably remote and closed data generation". Some of the advantages of using surveys are firstly: sample size; being large enough to be able to determine all sorts of statistical relationships, and secondly, the availability of many methodological handbooks for doing this type of research. The major limitations of the survey method are that the depth of research is limited solely to the selected aspects of the research object due to the extensive time and space of the research. Additionally, to do a survey, the researcher needs to know a lot about the background of the study and invest a great deal of time and energy into designing the research tools such as questionnaires (op. cit., pp. 149-154).

However, the survey method was found to be most compatible with this research. To do so, the influential roles studies of McLagan (op. cit.), which were conducted in the 1980s and 1990s, were selected for the research. The core of this methodology is that large groups of experts and HRD practitioners will be surveyed to find out the tasks, roles, outputs, ethical issues, and competencies that are needed for effective HRD practitioners such as AEIs.

1.3.4 Research methodology

The central part of this PhD project is the development of a competency profile for AEIs, which will serve as a basis for the guidelines of curriculum design and professional development of AEIs. Of course, designing a curriculum for AEIs is not the intention of the current study and requires further research projects. As discussed earlier, competency profile development implies a time-consuming research process, and is much more than just development work as such. The model questionnaire derived from studies of McLagan (op. cit.) is adapted to the Iranian situation and the context of agricultural instruction (see also Shim, 2006; O'Brien & Thompson, 1999). Because the HRD profession is very broad and diverse, the focus of the study will be on AEIs, as explained above. It is assumed that other sectors in HRD in agriculture and even HRD in non-agricultural sectors can also benefit from this methodology. In sum, the research is conducted according to the three major approaches outlined in sections 1.3.4.1 -1.3.4.3:

1.3.4.1 Description of AES in Iran: literature review/perceptions of farmers

In this first step, the (inter)national literature and practical field experiences of human resource development in agriculture in Iran was studied. The literature study attempted to provide an overview of the development of the field of HRD (Mulder, 2001) in general and more recent reviews that appeared in the Academy of Human Resource Development, the Human Resource Development Quarterly, the Human Resource Development International, and the International Journal on Training and Development. For a description of the field of agricultural education and training in Iran, relevant databases were used, as well as the public and private networks within and around the relevant Ministries and universities, including networks of relevant NGOs, the FAO, the World Bank and UNESCO. Thereafter, 102 farmers in 17 townships of the province of Esfahan were interviewed. As previously mentioned, farmers' perceptions about the changes they faced, their coping strategies, the information sources they used and the roles of AES/AEIs in their competency development, were carefully studied.

1.3.4.2 Policy Analysis: literature review/perceptions of experts

In this step, the agricultural policies, strategies, approaches, rules, and regulations in Iran were analysed; as a context analysis by means of a literature search in the appropriate scientific (electronic) libraries, and by the relevant Ministries. A literature search already conducted on agricultural education (with over 5,000 records) was used as well. Also all outstanding experts

in the field of AD/AES in the province of Esfahan (130 individuals) were surveyed in another complementary empirical survey. The experts are asked about AD/AES changes and problems, the importance of the present and potential future problems, and the organizations involved in farmer training.

1.3.4.3 Developing a competency profile for AEIs: literature review/perceptions of experts and farmers

For the development of a competency profile, after an intensive review of literature the methodology of McLagan was used and a selection was taken from the most experienced and informative agricultural managers, experts and instructors in the province of Esfahan. A total number of 257 respondents were identified for the survey. Outputs, standards, competencies, future issues and ethical issues for AEIs were asked of respondents and the results of different sub-groups (managers, technical specialists, and AEIs) were compared. Based on that, the major roles for AEIs in Esfahan were identified and a corresponding competency model was developed in four phases below:

Phase 1 – *Translation of existing materials – first version of the model*
On the basis of the existing lists (future forces, outputs, competencies, standards and ethical issues), available competency profiles, and the results from the literature review, a number of selective interviews with fifteen experts from the Agriculture Organization in the province of Esfahan were held in April 2004 to adapt the template lists to the Iranian AES context. The results of this phase were assumed as the preliminary lists of future forces, outputs, quality requirements (standards), competencies, and ethical issues for AEIs in Iran.

Phase 2 – *Validation of the lists – second version of the model*
A number of seventeen agricultural experts (ten from the ministry of agriculture and seven from the ministry of higher education (Esfahan and Tehran universities) was selected. They were asked to review and check the validity and accuracy of the draft version of the list (competencies, outputs etc.) provided by the researcher and based on the literature review and the McLagan model, that was used here as a template. This phase resulted in the second version of the lists that served as the survey questionnaire submitted to larger groups of experts, managers and professionals.

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Phase 3 – *basic data collection with the lists – third version of model*

The lists were transformed into a questionnaire and sent to a large sample of agricultural experts and instructors (a total of 257 individuals, including 100 experts and 157 AEIs) positioned in different townships of the province of Esfahan.

The data was analysed using appropriate inferential statistics (to detect core competencies) and comparisons between the results of the sub-groups were also made. The third version of the competency profile was then developed by differentiating the previously discussed elements of the model (ranked by importance).

Phase 4 – *triangulation of the findings of different studies – (fourth) final version of the model*

Finally the fourth version of the lists was elaborated based on the findings of other studies (experts and farmers). To do so, interpretations and implications of the results of different studies were deliberately taken into account to give more insight into the pertinent components of the competency profile and to bring about more in-depth analysis of the competency lists for AEIs.

In order to do that, the third draft of the competency model was chosen as the starting stage and for each item of the model the corresponding implications from other studies was integrated into the competency model.

1.3.5 Research instruments

Major research tools that were used in the different studies as part of this thesis are survey questionnaires (open-ended and close-ended) and interviews.

Additionally, an in-depth review of literature was used to support empirical research instruments. Specifically, the study of farmers involved interviewer-administered questionnaires.

The reason for not using self-adninistered questionnaires was that most of the farmers were poorly educated and unable to answer the questions independently.

For the remaining respondents who were agricultural experts, managers and AEIs the survey questionnaire was posted to their addresses along with a gift to encourage their participation and increase the response rate. Additionally, a follow up letter was sent to the respondents who had not responded after one month from posting of the questionnaires.

1.3.6 Analysis of the data

Because of the nature of the research, quantitative statistics were used, which are most compatible to survey research. Additionally, both descriptive (standard deviation, percentage, frequency) and inferential (Cronbach's alpha, Mann-Whitney U test etc.) analyses were considered and used in the different studies comprising this dissertation.

The data was analyzed using SPSS software. Descriptive techniques were used to analyse the data first. Next, the reliability of the items in the categorised questions was tested with Cronbach's Alpha Coefficient. When applicable, Pierson, Kendall's tau and Cramer's V Rank Correlation Coefficients were calculated to find possible relationships and Mann- Whitney U, Kruscal Wallis, F and T tests for exploring significant differences between variables. In addition, Exploratory Factor Analysis Test was applied for factor loading of similar variables and creating new components.

1.4. Definition of concepts

In table 1.3 the concepts used in the dissertation are summarily defined. Of course all mentioned concepts have many different definitions but the ones proposed here are the definitions that are considered in this research.

Table 1.3 Definitions of the terms used in the research

Concept	Definition
Human resource development	HRD is an integrated use of training and development, organization development, and career development to improve individual, group, and organizational effectiveness (McLagan, 1989).
Competencies	The areas of knowledge or skills that are critical for producing key out puts and are internal capabilities which may be expressed in a broad, even infinite array of on-the-job behaviours (op. cit.).
Competency job profile	Competency job profile describes the set of competencies particular to a position/job/occupational group/functional community (Draganidis & Mentzas, 2006). It is an underlying characteristic of an employee (e.g. motive, trait, skill, aspects of one's self-image, social role, or a body of knowledge) which results in effective and/or superior performance in a job (Rothwell and Lindholm, 1999) and particularly in this research it contains a list of outputs, standards (quality requirements), competencies, major ethical issues, and future forces for an individual's job (McLagan, 1989).
Outputs	They are products or services that an individual or group delivers to others, especially to colleagues, customers, or clients (McLagan, 1989).
Ethical issues	They are described as key areas of ethical challenge that HRD practitioners frequently face. Areas where the consequence of a wrong decision, action or choice could violate individual or group rights or otherwise jeopardize clients, other people in the HRD field, or integrity of the field itself (op. cit.).
Future forces	They can be assumed as conditions expected to have a significant impact on HRD outputs and competency requirements in the future (op. cit.).
Quality requirements (standards)	They are the characteristics of a quality input and answer the question "what must be true of this output in order for its users and HRD professionals to approve it?" they are not measures. They are qualities that may be measured by qualitative or quantitative tests (op. cit.).
Agricultural extension instruction (courses)	It is a part of agricultural extension programs in which farmers are taught about different important topics related to farming during short-term extension courses. AEIs who are mainly part-timers and subject matter specialists are the teachers of these courses. The course locations are mostly in farmers' villages and occasionally in the counties or townships. These courses are regulated by law and have to follow determined rules (Karbasioun, Mulder & Mirzaei, 2005; Mirzaei, 2004).
Agricultural extension instructors (AEIs)	AEIs are part-time employees of the ministry of agriculture (MAJ) who teach farmers different disciplines related to farming in extension courses. They are originally technical experts and subject matter specialists who work in various governmental and non-governmental organizations and cooperate with the MAJ in presenting extension courses. Therefore, AEIs have at least one other permanent job in addition to their temporary instruction career (The Ministry of agricultural-Jihad, 2004).

1.5. Study area (The province of Esfahan)

The province of Esfahan (or Isfahan) which is located in the centre of Iran was selected as the study location. It covers an area of 105,263 sq. km (about three times bigger than the Netherlands). Esfahan (3l 38'N & 51 40'E) stands 1,575 m above sea level and receives an average of 355 mm of rain per year. It is located 414 km south of Tehran, the capital of Iran. This province includes 19 townships, 42 counties, 79 cities, 12 central villages, and nearly 2400 smaller villages. Esfahan has recently had increases in both the services and industrial sectors respectively.

The city of Esfahan (the centre of the province of Esfahan) is currently the second largest city (after Tehran) in Iran and has more than three million inhabitants (Statistical Center of Iran, 2002). The figure 1.3 below shows the map of Iran and the location of Esfahan in the central part of the country.
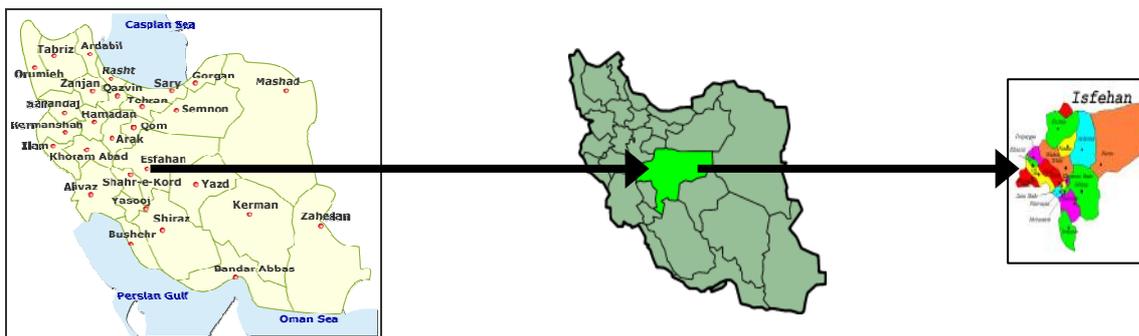
Figure 1.3 Location of Esfahan in Iran (Source: statistical centre of Iran, 2002)

1.5.1. Is Esfahan a good representation of Iran?

As mentioned before, the province of Esfahan was chosen as the research area. Some reasons for this being:

- Containing plains as well as mountainous areas, the province has three kinds of climates: dry, semi - dry and semi-humid. However, the largest part of the province has a moderate climate. It has several significant mountains and rivers such as the

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Zayandeh Rud. Therefore Esfahan is a diverse geographical, climactic, and topographical area.

- Due to plentiful water resources, agriculture and animal husbandry are of great importance in this province. This province, in addition to agriculture, is one of the most important industrial provinces and additionally contains rich natural resources.

- There are a total of 28 provinces in Iran. The following table 1.4 gives more details about the high comparative ranking of Esfahan with other provinces on different aspects.

Table 1.4 Ranking of Esfahan on different aspect in comparison to other provinces in Iran

Situation of the province of Esfahan compared with other provinces	Indicator		Rank
Total population	4316767	Person	2
Number of cities	60	Number	1
Number of agricultural instructors who are co-operating with agricultural organizations in Esfahan	152	Person	3
Number of formal employees of agricultural-Jihad organization of Esfahan who are synchronously working as AEIs	108	Person	3
Persons completed courses in permanent centres of technical and vocational training organizations	165973	Person	1
Graduates from universities and higher education institutes	13134	Person	2
The literate population (more than 80% of the whole population)	3492000	Person	2
Manufacturing establishments with 10 or more workers	1830	Units	2
Underground water resources and annual discharge by water organization jurisdiction	11548	Mil Cu m	1
Poultry products	78000	Tons	2
Number of industrial cattle-rearers	1702	Unit	2
Number of mines	176	Unit	2

Source: The Ministry of Agricultural-Jihad, 2004; Statistical Centre of Iran, 2001a

Table 1.5 also shows the rate of production of various animal products in Esfahan during the year 2000. It could be remarked that Esfahan places highly in terms of productivity in comparison to other provinces in Iran.

Table 1.5 The rate of animal production in the province of Esfahan in the year 2000

Kind of Animal product	Rate of production (ton)	Percentage of production in Esfahan
Red meat	48831	7.1
Chicken meat	69495	11
Egg	48533	6.8
Milk	463062	9.2
Honey	1418.5	11

Source: program and budgeting organization of the province of Esfahan, 2002.

Regarding the abovementioned characteristics of the province of Esfahan, and due to the fact that its climate is nearly similar to many parts of the country, it could be concluded that Esfahan suitably represents Iran as a whole. Although, most of the findings are applicable for AEIs in other parts and provinces in Iran we should, nevertheless, not prescribe the explicit results of the study for all provinces equally. Obviously, there are always some differences in culture, climate, characteristics of farmers, and facilities available for AEIs in different areas which must also be carefully considered.

Based on table 1.6 there has been a constant and significant reduction of the active population in the agricultural sector of Esfahan although the industrial and services sectors have been remarkably increased. The immigration from villages to the cities could be one important reason for this situation (Agricultural Organization of the province of Esfahan, 2002).

Table 1.6 Distribution of people across the major employment sectors of the province of Esfahan for the years 1955 until 1995

Year / Sector	1955	1975	1985	1990	1995
Agriculture	**52.3**	23.2	20	17.2	**14.5**
Industry	**30**	50.9	35.4	35.5	**42.1**
Services	**15.5**	25	42.3	47.4	**42.3**
Others	2.2	0.6	2.3	-	1.1

Source: program and budgeting organization of the province of Esfahan, 2002.

Concerning the severe drought in the years 2000 and 2001, all agricultural products in the province of Esfahan were unwontedly decreased. For instance, irrigated wheat production was decimated from 443,373 tons in a normal year to 201,556 tons (less than a half) or rice production shrunk from 79,008 tons to 28,940 tons in the dry years. Nevertheless, this decrease was not significant in apple production but very remarkable in sugar beat and onion production. These facts have been laid out in Table 1.7.

Table 1.7 The rate of production of the major agricultural products in the years 1996-2001

Kind of product	Rate of production (ton) in the years 1996-1997	Rate of production (ton) in the years 2000-2001	The percentage of negative changes
Irrigated wheat	443373	201556	- 54.5
Irrigated barley	257603	110914	- 57
Potato	494370	265170	- 46.4
Rice	79008	28940	- 63.3
Sugar beat	79008	146016	- 63.3
Onion	257053	143453	- 43.2
Apple	217802	182865	- 16
Cotton	18015	9648	- 46.4

Source: Mirzaei (2004) qouted from program and budgeting organization of the province of Esfahan, 2002.

1.6. Outline of the thesis

This Ph-Dissertation collectively encompasses three parts and nine chapters. Here, an overview of the different parts and chapters is presented.

Part I: Studies of farmers

This part of the thesis encapsulates four farmer research studies which comprise chapters two to five. Because farmers are the basic audience of AEIs, this part of the book is of a great importance for the whole project. In ***chapter two*** the major results of the pilot study, which was implemented in two townships of the province of Esfahan, is reported. A structured open questionnaire was used for interviewing 27 farmers selected from different disciplines and with diverse characteristics (in terms of land size, income, age level etc.). The results are categorized and analyzed using qualitative methodology and helped the researchers to modify and re-design the contents of the closed questionnaire of the basic study of farmers later. In the

pilot study farmers who did not participate in extension courses were investigated to gain their opinions. In chapters three, four and five of part (I), 102 farmers who had already participated in extension courses, from 17 townships of the province of Esfahan were interviewed. The aim was to examine the farmer's perceptions about their information sources, coping strategies, internal and external changes, and, most importantly, the roles of AES and AEIs in their competency development.

It is assumed that participant farmers of extension courses can offer worthwhile and trustworthy ideas about extension courses, AEIs, the supports they have received from AES/AEIs, their future needs, and the competencies that AEIs should have to be able to help farmers in extension courses. In more detail, *chapter three* focuses on the internal and external changes in farming and the most important farmer information sources and coping strategies. *Chapter four* principally pays attention to the supports AES has already provided for farmers and should offer in the future, the sources that alert farmers to extension programs, and the extent to which different extension projects have succeeded. In *chapter five*, the research is narrowed down to the functions of AEIs and the viewpoints of farmers about the roles and characteristics of an ideal AEI. Also, the motives of farmers for attending courses and the quality of the most recent courses they took part in are evaluated. In each chapter the implications of the findings of each study for the development of a competency profile of AEIs are discussed.

Part II: Studies of experts

This part consists of two chapters (six and seven) examining the opinions of the experts. *Chapters six and seven* include studies of agricultural experts in which 130 experienced and knowledgeable experts in the field of AD/AES, dispersed throughout all townships in the province of Esfahan, were selected and their views investigated. In these two chapters attention is being paid to the AD and AES changes, the problems hampering AD and AES evolution over the last decade, the importance of these problems and the priority given at present and in the future to resolve them. Therefore, part (II) aims at giving a better understanding of the context of AD and AES, their evolution in the last decade, and the implications they have for the competency profiles of AEIs. Additionally, the organizations involved in farmer training will be addressed in this part of study. In other words, it results in some indications for the

necessity, or priority, of specific competencies that AEIs should posses to address ongoing changes and problems that are constantly accruing in the process of AD and AES.

Part III: Synthesis - developing a competency profile for AEIs of Esfahan

This part comprises two chapters; chapter eight is the last empirical study, again considering agricultural experts, managers and AEIs; chapter nine deals with the triangulation of the developed competency model of AEIs. Therefore, ***chapter eight*** is the key study of the PhD project and its focus is on developing a competency profile for AEIs by pursuing the methodologies used by McLagan (op cit.). Future forces, ethical issues, outputs, standards, and competencies of AEIs in the next 3-5 years in Iran are examined in this chapter. In fact this study is the core research of the dissertation and will attempt to develop a tailor-made job competency profile for AEIs. In order to do that, as already mentioned, the model was adjusted to the AES system in Iran. Then it was translated into Persian and finally a closed questionnaire was developed and sent to all 150 AEIs and 100 selected agricultural experts and managers from 17 townships of Esfahan. This chapter will be used as the cornerstone for developing the final version of a competency profile of AEIs.

In ***chapter nine***, the competency profile achieved in the previous study was elaborated based on the findings of the other studies in this PhD project. In this model the various perspectives of farmers and HR professionals in the field of agriculture such as AEIs, agricultural experts, and managers were put together to bring about a reliable competency model for the role of AEIs in the next three to five years. Therefore, in this part of the dissertation, a new synthesis of the acquired competency model was developed. Of course the new synthesis is only a starting point for designing a more innovative competency model for the target group and is not a definite proposal. Chapter nine then offers some guidelines for the professional development of AEIs, the limitations of the study, suggestions for further studies, and closes with some concluding remarks.

Concluding remarks

Given the review of HRD and competency modelling research in the agricultural extension field in chapter one, it could be generally concluded that HRD/M in the Iranian agricultural extension system is still far from ideal. A Meta-analysis by the researchers introduced in this chapter clearly revealed this phenomenon. It was also uncovered that AEIs, as a group of HR professionals in the agricultural extension system, are confronted with many difficulties, both intrinsic and extrinsic, in the operation of their instructional careers. Therefore, the evidence discussed in Chapter One confirms the fact that the competencies of AEIs should be improved if they are to effectively support farmers during the extension courses. It was, likewise, illustrated that because of the prevailing characteristics of the competency model proposed by McLagan, this model was selected as the cornerstone of the research. In addition, the studies of farmers and experts (six studies in total) are applied to triangulate and increase the reliability of the model. It was also shown in Chapter One that the province of Esfahan could be considered to appropriately represent Iran as a whole. However, it was recommended that national inquires should be carried out in order to ensure that the results are explicitly applicable for other provinces too.

Part I: Studies of farmers

Overview

Farmers are the basic target group of AEIs and so their opinions are undoubtedly determinant factors for this study. For this reason farmers were the starting-point for this research. In sum, four studies of farmers are encapsulated in part I. First, in Chapter Two a pilot study is described with 27 non-participant farmers in extension courses. A qualitative research method was used in this study. By choosing non-participant farmers it is intended to investigate the views of those farmers who did not receive any help from AEIs and to see their viewpoints about changes, difficulties and the role of AES/AEIs in supporting them. The next three studies of farmers (chapters three, four and five), are aimed at exploring the views of participant farmers in extension courses. Therefore, 102 farmers were interviewed using quantitative research methodology. Because the target group, and also the methodology, of these three studies are all the same, demographic profiles and research methodology will only be presented in chapter three and not in other chapters; to avoid repitition. Chapter Three focuses on the changes, information sources, and coping strategies of farmers. Chapter Four concentrates on the roles of AES/AEIs and the extent of support they provide to farmers. The differences between current and expected supports are measured in this chapter as well. In Chapter Five, attention is dedicated to the courses AEIs present and the competencies of instructors who farmers met in the most recent courses they had attended. Finally, the farmers' views about the ideal AEI are investigated. Collectively, the four farmer studies have afforded beneficial inferences to be made to determine the components of the proposed competency profile of AEIs. These inferences will be discussed in the conclusion part of each chapter and particularly in the synthesis part of the dissertation (part III).

Chapter two

Changes Farmers Faced, Coping Strategies and Competencies Needed – a Pilot Study♣

2.1 Introduction

According to various studies, the agri-food sector in Iran has not yet shown any significant development during the last decades. More than 50% of the total available land, water, and natural resources have not been cultivated. Just 37% of all cultivable lands in the country, and only 58% of all acquirable water, have been utilized up to this point (Tahmasebi, 1998). In addition, sustainable land use has not been practiced. For instance, about 30% of the forests located in the North of Iran have been destroyed during the last two decades. Furthermore, a large portion of pasture and grassland became unproductive because of overuse by the cattle of nomads and farmers (Darvishi, 2003). Karshenas (1994) contended that the difficulties within Iranian agriculture have resulted from inefficient resource management by actors within the sector, rather than by a squeeze of natural resources in agriculture. Hence, more consideration to human resources in the agricultural sector is essential. Since farmers and land users are the primary active human resources in the agricultural sector, increasing their competence is of necessity to improve the efficiency and productivity of farming. Today this is becoming increasingly important because of the competitiveness within the sector.

2.2 Purpose and research questions

In this contribution a study is described that is part of a larger study on the development of a general competency profile for instructors who are working in the extension services in Iran and who support farmer competence development. The competency profile will be based on the analysis of trends and developments in this sector. The purpose of this contribution is to report on a study amongst a sample of farmers in Isfahan. There are three research questions in this part of the study:

- What changes have occurred regarding the situation of farmers during the last decade?
- How did farmers cope with the changes that occurred?
- What competencies do farmers have and which competencies do they need to develop?

2.3 Methods and data sources

The study reported in this contribution was conducted in Esfahan, which is the second biggest province of Iran (there are 28 provinces in Iran). Agriculture and farming, in this province, are representative for the whole country. The study is based on a library and internet search, and personal interviews, in which a semi-structured open-ended questionnaire was used. For the interviews a sample of 27 farmers in two important townships of Esfahan province were examined. Four of the respondents were big farmers (owning more that 10 hectares of cultivated land), and the remainder were small or medium-sized farmers. All farmers were in crop production and animal husbandry, 80% had very little education (at the level of reading and writing elementary phrases and sentences), but more than 10 years of experience in agriculture. All were married, and had at least 3-4 children. Elements of the questionnaire were: 1. questions about changes; 2. coping strategies; 3. support of extension and education; 4. added value of courses; 5. assessment of competencies (general and technical). The interviews took place in the period of March 2004 until April 2004. Personal interviews were used, firstly, because the majority of farmers are not sufficiently literate, and secondly, to explain the questions and give respondents the opportunity to ask for clarifications if necessary. The interview results were analyzed qualitatively by hermeneutic techniques. As has been said, this study is part of a larger study, in which a larger number of respondents will take part. This study is currently underway.

2.4 Results

In this section, the results of the study will be presented following the three research questions that were formulated earlier regarding: 1. the changes that occurred, 2. the coping strategies of farmers, and 3. competence development.

2.4.1 As to the *changes* that have occurred in the situation of the farmers during the last decade, the results can be summarized as follows. About 80% of the farmers interviewed stated that there has not been any significant change in the technical aspects of their farming. However, they reported a significant negative change regarding the financial aspects of the farm. There was a continuous increase in prices of agricultural inputs during the past years,

combined with the ever decreasing profitability and value of agricultural products caused by high inflation in the country. Furthermore, the respondents reported that detrimental environmental changes, such as drought, have occurred during the last couple of years. This unexpected negative weather also had a negative influence on farming activities and the use of natural resources. According to farmers, the Ministry of Agriculture was unable to support them financially during this severe period. As a result, many small vulnerable farmers were completely demoralized and impoverished.

Nearly all respondents unanimously agreed that the quantities of various inputs such as pesticides, seeds, and fertilizers, had significantly diminished yet their prices had remarkably increased. Even extension services centres, which are expected to deliver necessary inputs at cheaper and reasonable governmental prices, do not have sufficient quantities of inputs available to cope with farmers' demands.

As to the application of new technology and mechanization in farming, about 75% of respondents did not believe that there had been any promising development toward using new technological farming systems. In their opinion the Ministry of Agriculture has not supported farmers appropriately in terms of delivering financial support in the form of long-term loans and subsidies. Instead, the Ministry has concentrated on a number of selected new technologies in agriculture for a limited number of farmers, such as under-pressure irrigation methods. The results support the studies of Karami (1993; 2001) in which he showed that extension organizations are mostly concentrating their efforts on villages where farms are larger and more developed, and to some extent, nearer to the rural services centres.

Although supporting farmers, who owned larger farms, with greater production and income levels, had a remarkably positive effect on their productivity, the benefits of this progress were not shared across the entire farming population, and many farmers have remained in poverty. Therefore, this practice will have undesirable effects on agricultural sustainability and the capability of a large number of farmers to cope with the challenges they face.

According to farmers there had been no considerable change in extension and education practices. They said that there were very limited extension and instruction services, and the provision of training was infrequent and generally ineffective. The majority of respondents

were not involved in extension programs nor had contact with extension personnel. In their eyes little had changed, since the survey of Moczarski in 1978. He showed comparable results and concluded that many extension programs did not appropriately meet farmers' expectations and rarely employed participative methods.

2.4.2 Regarding the *coping strategies* of farmers, the results are the following. Of the 27 respondent farmers, 65% said that they had to rely purely on personal initiative and cope with changes by trial and error. Most help was informal, mainly from friends. A typical farmer's response was:

'*Most of the times we have had to solve our problems independently or by getting help from our friends and not extension agents!*'

The minority (25%) of respondents considered extension services to be important and effective. Typical responses were:

'*Extension centre employees usually come to our lands very rarely and they just visit our farms and return (because of their responsibility) without giving any specific help*'.

or:

'*We have been supported sometimes by extension and services cantre's personnel. They also want to help us but the problem is sometimes even they don't know how to do it*'.

Only three farmers – owning big farms - received the support of private and independent companies. Moreover, due to the low educational level of farmers, they have limited or no access to new printed agricultural information in relevant books, articles, and journals. General statistics emphasize this point too. About 40% of the population of farmers is over 50 years of age and more than 60% of them have received no formal education at all. As a consequence of this, agricultural development in Iran is extremely difficult at the moment (Tahmasebi, 1998). Bageri and Shahbazi (2003) found this result in their study as well. They showed that a large number of young farmers only learn new competencies by themselves and from their personal experiences on the farm. They also found that there is a significant relationship between the

contact farmers have with information sources, their age and participation in agricultural activities, and their competencies.

2.4.3 Regarding the *competence development* of farmers, the main result is that there is a huge opportunity for improvement. Regarding *technical competencies*, the results showed that about 75% of farmers merely followed the traditional and local skills that they learned informally over the years via their fathers and friends. But these competencies do not live up to the requirements needed to cope with the new and profound changes and expectations in agriculture. This problem can easily be observed in all aspects of farming activities such as planting, irrigation, plant protection and harvesting. Previous findings revealed the main reason for this technical capability deficiency is the poor communication between researchers and farmers. In other words, most agricultural research has not managed to reach farmers. The low educational level of many farmers also served as a barrier to implement research results, as these farmers could not apply the new information in their real situations (Karami-Dehkordi & Pezeshki-Raad, 1997).

Consequently, they had little chance to increase their levels of production and income. A survey conducted in the Fars province (in the southwest of Iran) supports this too (Karami & Torkamani, 1992). This survey showed that the technical approach in research and extension did not result in improved farming systems, especially not when it comes to small farmers. The study suggested implementing more flexible extension and research programs to learn more about complex farming systems and the effectiveness of activities that are aimed at the improvement of farming practices. A recent study (Bageri & Shahbazi, 2003) among the rural youth in Iran also showed that the target farmers have a lack of technical competencies in all stages of farming activities (such as planting, harvesting, plant protection and using agricultural machinery). According to the results of that research, 75-82% of young farmers need to be taught and equipped in all of the aforesaid aspects of farming.

As mentioned before, the majority of respondents had a low education level or had no education at all. Consequently, they were lacking some important *general competencies* which are crucial in farming innovations and income increments. These are competencies like communication, management, leadership, research skills, co-operation or group work, and program planning. The results showed that about 90% of the respondents had insufficiently

mastered these competencies. The other 10% of respondents (3 persons) did master these general competencies and subsequently had responsibilities in rural councils and other participatory and voluntary associations and councils. These results confirm the assessment of information of farmers, which was done in south-eastern Iran (in the Azarbayejan province) (Rezvanfar & Vaisy, 2003). This research revealed that the majority of farmers had a low information input score. Information output, inter-system communication, farmer-researcher communication, family education statues, and availability of input facilities were all directly related to information input. The majority of these variables are strongly related to (lack of mastery of) general competencies.

2.5 Conclusions and discussion

The study shows that the majority of farmers need intensive competence development in the technical, as well as, in the general field. The present extension service does not effectively provide these. The main coping strategy employed by farmers is trial and error and reliance on their social network. The Ministry of Agriculture (MAJ) should support this, but has too little direct contact with the target group. There have been many attempts to improve the situation, but they were not as successful as hoped. The Ministry of Agriculture is aware of this situation, and established a consultation committee, which is composed of 17 Iranian and 15 international consultants. This committee proclaimed that less than 5% of all employees in the Ministry have direct and personal contact with farmers. Due to this, many barriers in the process of delivering new information, skills and competencies to the farmers and land users have inevitably been generated (Lotfi, 2004). If the results of this study are representative for Iran, we can conclude that many farmers in Iran are not sufficiently equipped with professional competencies to empower themselves to generate more products, earn a higher income and also bring about sustainable agricultural development and natural resources. Thus, official and private agricultural extension institutes should mainly concentrate on performance improvement, instead of merely paying attention to traditional extension and education methods and exclusively delivering unfeasible, theoretical, and irregular information to farmers.

To do so, we formulate the following recommendations:

- In the present situation the Ministry of Agriculture should support the provision of sufficient agricultural inputs and income to farmers by following an effective pricing policy. Also there should be explicit control and supervision by the Ministry on prices of agricultural products in the market. As a consequence of this farmers will be helped to buy required inputs at reasonable prices and benefit more from their products. Unfortunately, at the moment, farmers are simply the hard-working primary producers at the mercy of the dishonest input suppliers and product dealers who are earning a significant amount of money at the cost of these farmers.

1 It is recommended that the Ministry of agriculture allocate more funds to help farmers financially by offering long-term loans because in the current situation agricultural banks are paying little money via short-term contracts to farmers, which is not sufficient. Additionally, it is hard for farmers to return this money on time.

2 We further recommend the distribution of extension services among a large number of farmers and natural resource users, utilizing small but efficient and sustainable extension plans, instead of focusing on a few selected farmers and following merely centralized extension projects.

3 There is still a remarkable discrimination between small and big farmers and land users in terms of support and availability of inputs and extension services. Thus, it could be suggested that the Ministry of agriculture, and especially the extension organizations, try to support all farmers, particularly small farmers, to cope with the challenges they face.

4 Finally, since a number of technical and general competencies are lacking among farmers and land users, it is recommended that extension instruction and other rural educational services concentrate on these critical competencies. This should be conducted from the perspective of organizational (farm or agri-business) and individual (farmer, entrepreneur or employee) performance improvement, since competence development only makes sense if this performance improvement perspective is used (Mulder, 2004). Likewise, a structural revision in the preparation and planning of various courses is needed to support the competence development of farmers.

Chapter three

Changes in Farming, Information Sources, and Coping

Strategies of Farmers⁕

⁕ An adapted version of this chapter has been submitted to the Journal of Agricultural Education and Extension.

3.1 Introduction

The world is changing, as is agriculture, both in developing and developed countries; although at different rates. In other words, the global economy, competition, climate changes, food security, and quality management all put a tremendous pressure on the primary modes of production; trade; the food production industry; and the government to promote demand led sustainable agriculture and land use. Consequently, farmers, as the main actors in agricultural systems, have been struggling with expected or unexpected changes in their field. They have tried to cope with the changes by looking for opportunities or trying to avoid or diminish problems occurring under these new circumstances. While some farmers may benefit from economic globalization by shifting to production for export; accessing wider markets for their products and finding alternative income sources, many other farmers are endangered and threatened by the low production prices, declining subsidies, competition from cheaper agricultural imports, changes in credit availability, lack of access to international markets and high quality inputs (Leichenko & O'Brien, 2002). Smiles (1997) in South Australia and Short and Tricker (1994) in the U.K. are two of the many researchers who have attempted to track these changes and their consequences. They unanimously referred to the complexity of the changes in farming and reported the incidence of many intervening factors.

Bingen et al. (2003) underlined these facts in their exploratory meta-analysis research and pointed out that a great number of farmers experience considerable difficulties in coping with ongoing changes in their careers. They have very limited access to agricultural goods and services and access is often subordinate to, or dependent upon, external funding. The researchers suggested that farmers need to get organized to be able to compete in the market if they want to conquer the changes and challenges their industry has undergone. However, there is great concern about the effects of the agricultural practices of farmers on the environment and quality of life in general. Hence, during the past several years many researchers have attempted to address these concerns by focusing on factors such as farming challenges, farmers' information sources (IS) and farmers' coping strategies (CS) (e.g. Bruening, Radhakrislma & Rollins, 1992; Kessler, 2005; Leeuwis & Van den Ban, 2004; Van den Ban, 1996).

In the present study these aspects are examined as a basis for developing a "competency profile" for agricultural extension instructors (AEIs) who form part of the professional human resource (HR) contingent in the field of agricultural extension (Karbasioun, Mulder, Biemans, 2007a; 2007b; 2007c). We must clarify the items to describe the facets of farmers' behaviour that can help us to define the "competencies"AEIs need to support farmers as effectively as possible. In order to do this we will first describe the difference between the variables "IS of farmers" and "CS of farmers". In sum, they differ depending upon the extent to which the problem is stressful and risky for farmers (see Sligo & Massey, 2006). In other words, when farmers deal with a crucial situation in which the problem should be solved as soon as possible, they use CS to prevail over the problem. On the other hand, in the event that there is no critical situation to be addressed and farmers simply want to be acquainted with innovations in their field they take advantage of IS (Blum, 1989; Korsching & Hoban, 1990; Singhal & Dearing, 2006; Solano et al., 2003; Zamani et al., 2005). It must be said in this paper that IS can be considered simultaneously as CS when the nature of the problem changes from one of innovation to one of urgency (crucial). Due to the importance of these variables, many studies have taken place to investigate IS and CS of farmers. Some of these are introduced in the next part of this chapter.

3.1.1. Information sources (IS)

Blum (1989) determined the use of different IS for the decision making of Arab farmers in Israel. Among these Arab farmers, extended family was still one of the major sources of initial information. In terms of the decision to adopt an innovation, official extension advisors had a very strong influence. Solano et al. (2003) obtained nearly the same results in their study of 91 Costa Rican dairy farmers and discovered that family members and technical advisors were the most preferred IS for farmers; while, commercial private agents were the least preferred information sources.

Another study among 731 Iowa farmers revealed that the farmers consider field demonstrations, study meetings, cooperating extension organizations and state university as the most important IS in their work (Bruening & Martin, 1992). Korsching and Hoban (1990) also assessed the primary sources of information used by Iowa farmers in the decision to adopt new practices by interviewing 600 farmers. They listed the most important IS in descending order

of importance as: other farmers, local agricultural product dealers, and local government agencies. Mass media sources were relatively unimportant. On the contrary, Austen et al. (2002) pointed out that for Australian farmers the mass media was of great importance to inform them of climate changes. They also uncovered that an average of 76% of farmers use computers in their homes and 30% are connected to the Internet. In the same way, Kleih and Janowski (2004), from their study in Uganda, investigated farmers' market IS and realized that the family, neighbours, radio, and traders respectively are the most important IS. Comparing the two last examples (Australian and Ugandan farmers), it is revealed that the farmers in developed countries use more new information technology as their information sources than farmers in the developing world. Kromm and White (1991, p. 411) also explored IS of irrigators in high plains in the U.S.A. They discovered that:

> "The reliance on kind of IS related more to the location than farmers' characteristics. Mass media and advisor-oriented sources were the most important IS, leading irrigators to adoption. The three best discriminate adoption behaviours were private agricultural extension, research stations, and trade magazines".

3.1.2. Coping strategies (CS)

With regard to CS of farmers, Light et al. (1990) discovered, through their research among 258 Midwestern male ranchers in the U.S., that 87% of farmers coped with difficulties by trusting in God. Their target group was generally reluctant to accept help from extension professionals, neighbours and relatives. Farmers primarily solved their problems independently. Although, in the research of Hayati and Karami (2005) in Iran, just 20% of farmers were found to be autonomous problem-solvers and the majority (70%) were more or less willing to get help from official and private individuals and companies. Zamani et al. (2005) also carried out research in Fars (a province in southwest of Iran) to explore the changes in farmers' psychological CS when dealing with adversities. They revealed that targeted farmers endured various stress producing situations such as drought, dry spells, water salinity, loss of investment, limited access to agricultural inputs, unemployment, low income, and debt. They contended that farmers normally show three different coping behaviours (aggressive, withdrawal and adaptive) to overcome the above-listed sources of stress. In the current study the focus is on the adaptive coping behaviour of farmers, which is more practical rather than psychological aggressive and withdrawal coping behaviour. Austen et al. (2002), in their survey among

Australian farmers, revealed that weather and climate variability had a large influence on their farms and accordingly a wide range of strategies were used by farmers to cope with variable climate conditions. However the selected farmers mainly used short-term weather forecasts (TV and radio) and less than 50% of them read seasonal climate outlooks. The researchers concluded there was a need for wider extension support if farmers were to use all of the available strategies possible.

3.1.3. The Iranian context

Regarding the changes in farming systems in Iran, it is evident that agricultural development has not yet evolved convincingly (e.g. Karami, 2001; Zamani et al., 2005; Zarafshani, 2002). Consequently, more than 50% of Iran's total available land, water, and natural resources remain untapped. But farmers and nomads have abused these valuable natural resources; several statistical reports stress this fact. As a result a large proportion of pasture- and grass-lands have lost their productivity from overuse and exploitation (Statistical Centre of Iran, 2001a; Karami, 2001; Karbasioun & Mulder, 2004a). It could be said that the struggle with poverty endured by Iranian farmers is a sign of their unsuitable farming techniques.

Therefore there is a growing tendency amongst policy makers and researchers to try to reduce this poverty while ensuring agricultural sustainability is taken into account (Ruben & Pender, 2004). Some specialists disagree with the common assumption that poverty reduction and environmental sustainability goals are inherently complementary. They have documented this opinion with various empirical confirmatory studies (Barrett et al., 2005; Karami, 2001; Karami & Rezaei-Moghaddam, 1998; Hayati & Karami, 2005). However some researchers have taken a more optimistic view and reported "poverty alleviation phenomenon" in rural areas over the last decades. For instance, Assadzadeh and Paul (2004) queried the poverty evolution in Iran during the years 1983 to 1993.

Hayati and Karami (2005) recognized different farmer groups based on their CS in Fars (a province of Iran). They stated that 50% of farmers are structural about the cause of their poverty. It means that they place the responsibility with situational factors such as lack of education and low wages. 30% of farmers were individualistic and attributed their poverty to their own fault. Finally 20% were fatalistic and saw their poverty as a result of bad luck (fate).

They pointed out that individualistic farmers were most likely able to cope with the problems and difficulties they encountered. To help Iranian farmers deal with the changes and difficulties in their work, various training programs have been provided for farmers and nomads by the Ministry of Agriculture (MAJ), in co-operation with some other organizations in the field of technical and vocational education such as the Red Cross, youth national organizations etc. Connected to the implementation of these programs is an integrated evaluation system but because of various shortcomings both in executing and evaluating of the programs, it has not performed convincingly enough for the authorities to make the recommended changes regarding these extension programs (Karbasioun, Mirzaei & Mulder, 2005). Nevertheless, a great number of studies have shown that training programs are positive and have added value for farmers (e.g. Chizari, Karbasioun & Lindner, 1998; Mirzaei, 2004; Karbasioun & Mulder, 2005; Karbasioun & Chizari, 2004a; 2005; Zamani & Talebianpour, 2001).

The pilot study of this research showed that farmers faced serious difficulties in coping with the negative changes and problems they encountered, and they usually had to overcome these changes by relying on their own individual enterprise or on support from relatives and friends (Karbasioun & Mulder, 2004a). Despite previous research, it is still unclear what sort of changes farmers have experienced and how they themselves have coped with those changes, particularly in recent years. After clarification of these points we also want to know what kind of IS are generally used by farmers and what is the association between farmers' personal characteristics and their CS and IS? Eventually, we want to know if the findings of this study can contribute to the preparation of a competency job profile for AEIs; which is the aim of the overall project governing this study.

3.2. Purpose and research questions

As mentioned, the current study is part of a bigger research project aimed at developing a job competency profile for AEIs. Developing such a competency job profile will help policy makers to recruit the most efficient AEIs who can provide better support to farmers via extension courses. The principal purpose of the bigger project is to make a trustworthy profile for the future roles of AEIs considering different (but including farmers') perspectives. To develop such a competency profile, a multi-dimensional strategy was applied. In brief, the perceptions of agricultural experts, managers, farmers and AEIs were collected using

interviews and closed questionnaires. It is assumed that farmers, as their principal audience, are supported by AEIs, therefore, this research and two other parallel studies were enacted to uncover farmers' perceptions regarding their difficulties in coping with intrinsic (in farm) and extrinsic (out of farm) changes, the most important IS used by them, and the competencies they indisputably need to appropriately carry out their profession.

We also intend to explore how, and to what extent, these competencies have been fostered by agricultural extension services (AES) and specifically AEIs. Hence, it is expected that farmers, as the main recipients of AEIs' recommendations, can offer the most useful information to uncover the underlying basic features of an AEI to form part of a competency profile. However, the main purpose of the current study is to assess farmers' perceptions of internal and external farm changes and the IS and CS they have benefited from to overcome the changes in and around their farms. The following research questions were formulated in this study:

1. *What kinds of changes (internal and external) have occurred in farmers' careers over the last decade? Were these changes positive or negative and to what extent?*
2. *What kind of Information Sources (IS) have been commonly used by farmers?*
3. *What kind of Coping Strategies (CS) have farmers used to overcome unexpected stressful changes?*
4. *What relationships are recognizable between farmers' personal and field characteristics on the one hand and their perceptions of changes in farming, IS and CS on the other hand?*
5. *What are the implications of these findings for a competency job profile of AEIs?*

3.3 Methods and data sources

In this study data collection consisted of a questionnaire completed by means of a personal interview with farmers. Before implementing the main study a pilot study was done. For this, a number of 27 explorative interviews were held with farmers in two townships of the province of Esfahan. Farmers from different disciplines and with different personal and field characteristics were selected. A semi-structured questionnaire was used for the interviews in the pilot study. Based on the results of that, the major questionnaire was developed. The target

group of this study consisted of the farmers who had participated in the extension training courses offered by the "Agricultural Extension Services" (AES) in the province of Esfahan during the year 2004. The reason for choosing these farmers was the fact that the results of this research are supposed to provide applicable information for the main research (developing a competency profile for AEIs). Thus, participant farmers were the most likely candidates to be able to give us trustworthy information about how, and to what extent, extension courses have served them to cope with changes alongside other supportive programs. They can also say to what extent they have relied on extension courses and AEIs as their IS or CS.

Because of the great diversity of AES programs, which encompass different agricultural contexts and deal with various domains, a select stratified sampling method was applied to cover all different areas. The sample was composed of 102 farmers who had participated in agricultural extension training programs and were distributed in 17 townships of Esfahan. In each township farmers from different categories such as animal keepers, crop growers, rangeland users, fruit producers, or mixed categories etc. were selected. In addition, it was ensured that farmers with diverse personal and farm characteristics were included in this study.

The interview process lasted two months from March until April 2005. A closed questionnaire was used for interview. In designing the closed questions, a 5-point Likert-type scale was applied. Since the educational level of the majority of the farmers in this study was low, experienced experts were selected and taught to interview farmers. The questionnaires were completed during the personal interviews conducted in the farmers' villages (their farms or homes). As the farmers were usually busy with their farming activities during the months of interview, suitable times were appointed by getting help from rural council members in their villages. Each interview lasted approximately one to one and a half hours. During the interview certain explanations were given by interviewers to clarify any issues the farmers' had difficulty with. To test the validity of the questionnaire, 13 copies were provided and distributed among four professors and academic staff of Wageningen University and also nine agricultural experts from Iran. Moreover to assure the reliability of the questionnaire, it was pilot-tested amongst a group of 22 farmers who were comparable with the target population. Finally, based on the expert appraisal and pilot-test with farmers, the questionnaire was amended where necessary. The structure of the final questionnaire is as below (number of questions for each topic is mentioned between brackets): Demographic profile of respondents (8); kinds of agricultural and animal products farmers produce on their farm (7); perceived changes in their farming

activities since the last decade (59); farmers' reported CS (17); farmers' reported IS (13); and extent to which they have been able to cope with changes in their own eyes (1). The data was analyzed using SPSS software and applying descriptive (mean, standard deviation, percentage, frequency) and inferential statistical analysis (Chronbach's alpha, Cramer's V, Kendall's tau, Mann-Whitney U and Kruscal Wallis). Finally it should be said that the results of this study can not be generalized to the whole farmer population of Esfahan because it is very likely that non-participant farmers have different and possibly opposing opinions about the research questions. So, further study is suggested to assess the opinions of both participant and non-participant farmers. The research methodology described above was also applied to the studies outlined in chapters four and five and is therefore not subsequently repeated.

3.4 Results

Firstly the demographic profile of the farmers in the study is reported. It should be mentioned that the same target group of farmers applies for chapters four and five and so the demographic profile presented here is not subsequently repeated. After presenting the demographic profile, the findings of the study with regard to the research questions will be elicited.

3.4.1 Farmer characteristics

The demographic profile of the farmers who participated in this study is described in table 3.1. As can be seen in table 3.1, only 4% of farmers were uneducated. Of the respondents, 40% had reached primary school level, 22% secondary school level and about 30% possessed a high school diploma or a higher degree (4% of farmers did not respond to this question). Of the group, the majority were male (83%), married (86%) and nearly 60% were over 40 years of age. Also, a considerable number of respondents (44%) possessed between one to five hectares of land under cultivation and 21% had more than ten hectares of land. Additionally, around 80% had personal land (irrigated or dry-land) of which only 20% had dry land under cultivation. In addition, the inter-relationship of farmers' personal traits was measured using Kendall's tau (Kt) test. This showed that older farmers had mainly low education levels (Kt= -.436**, Sig. = .000, N= 100); also, married farmers (men or women) were generally older (Kt=.454**, Sig. = .000, N= 100) and less educated (Kt= -.384**, Sig. = .000, N= 100) in comparison to single farmers. These personal characteristics of the farmers were very similar to

farmers' characteristics in previous studies (Chizari, Karbasioun, & Lindner, 1998; Karbasioun & Chizari, 2004a; Karbasioun & Mulder, 2004a; Karbasioun, Mirzaei, & Mulder, 2005).

Table 3.1 Demographic profile of the participating farmers

Variables	*f*	*%*	*Cum %*
Level of education (*n* = 101)			
Uneducated	4	4.0	4.0
Primary school	40	39.6	43.6
Secondary school	22	21.8	65.3
High school	5	5.0	70.3
Graduate from high school	21	20.8	91.1
Associate and Bachelor	9	8.9	100.0
Gender (*n* = 100)			
Male	83	83.0	83.0
Female	17	17.0	100.0
Marital status (*n* = 101)			
Single	14	13.9	13.9
Married	87	86.1	100.0
Age (years) (*n* = 102)			
18-30	27	26.5	26.5
31-40	16	15.7	42.2
41-50	26	25.4	67.6
50-80	33	32.4	100.0
Irrigated land size (hectares) (*n* = 94)			
Smaller than 1	19	20.2	20.2
1-5	41	43.6	63.8
5-10	14	14.9	78.7
Bigger than 10	20	21.3	100.0
Dry-land ownership (hectares) (*n* = 89)			
Yes	18	20.2	20.2
No	71	79.8	100.0
Kind of land ownership (*n* = 99)			
Personal	81	81.8	81.8
Partly personal and partly not personal	12	12.1	93.9
Not personal	6	6.1	100.0

In sum, 17 (nearly all) townships of the province of Esfahan were selected for this study (table 3.2). The numbers of farmers from each township varied because of the size of each township and the number of farmers in each township.

Table 3.2 Distribution of the farmers over the various townships in the province of Esfahan (n = 102)

Township	*f*	*%*	*Cum %*
Esfahan	18	17.6	17.6
Khomeini Shahr	5	4.9	22.5
Shareza	6	5.9	28.4
Tiran-va-Karvan	3	2.9	31.4
Natanz	5	4.9	36.3
Fereidan	7	6.9	43.1
Falavarjan	4	3.9	47.1
Lenjan	2	2.0	49.0
Dehagan	7	6.9	55.9
Daran	5	4.9	60.8
Khansar	9	8.8	69.6
Semirom	10	9.8	79.4
Borkhar-va-Meime	6	5.9	85.3
Mobarake	5	4.9	90.2
Naein	5	4.9	95.1
Chadegan	1	1.0	96.1
Najaf Abad	4	3.9	100.0

A large majority of farmers (87%) were involved in crop production, 57% in domestic animals, 48% in fruits and orchards and 20% in vegetables (table 3.3; combinations of products where possible). Flowers, fish and handcrafts were not very common as products.

Table 3.3 Distribution of the farmers in terms of products

Kind of product	*f*	*%*
Crops	88	87
Domestic animals	58	57
Fruits and orchards	49	48
Vegetables	21	20
Handcrafts and artifacts	6	6
Fish	3	3
Ornamental flowers	0	0

3.4.2 Research question 1-1: perceived internal changes

Internal changes in this research are defined as changes in farmers' behaviour regarding their agricultural career. To examine the perceived internal changes that farmers have experienced a total of 29 questions were asked from respondents upon interview.

To avoid redundancy, only the highest and lowest extremes of perceived internal changes over the last decade are listed in table 3.4. In general, farmers felt they had not greatly developed on any of the questioned internal changes; nevertheless, their responses elicited a perceived moderate development on ten items listed in part A of table 3.4 and all ten internal changes were rated on average between 3.9 and 4.5 on a 5-pointscale (1= Very unimproved; 2= Slightly unimproved; 3= No difference; 4= Slightly developed; 5=Very developed).

From table 3.4, it can be discerned that farmers perceived that they have developed their overall information, skills and capabilities to properly use hybrid seeds on their farms. Also, average yield per hectare, investment in agriculture, contact with extension agents, career satisfaction, co-operation and friendship with other farmers, using pesticides, herbicides etc. on the farm and, finally using drugs and medicines in order to prevent and cure common animal diseases, have slightly increased ($3.9 \geq M \geq 4.5$, $.05 \geq sd \geq .10$).

In part B of table 3.4 the five least developed internal changes are introduced. They indicate the marginal development of the marketability of products, packaging and food processing, getting help from family members, initiating small industries and applying fertilizers on the farm (3.2 $\geq$ M $\geq$ 3.4, .08 $\geq$ sd $\geq$ .11).

These findings support the other recent studies undertaken as part of the overall project carried out by the researcher et al. and other researchers in the field (see Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c; Beygi, Zarafshani & Chizari, 2000; Bageri & Shahbazi, 2003).

Table 3.4 Rank, mean and standard deviation scores of internal changes in farming as perceived by the farmers

Internal changes	N[1]	r[2]	M[3]	SD
A. Highest scoring perceived internal changes				
1. General knowledge about new methods and principles in agriculture and animal husbandry	100	1	4.5	.05
2. Necessary skills for using new methods and technologies	101	2	4.4	.05
3. Using hybrid seeds properly on the farm	95	2	4.4	.07
4. Average of agricultural and animal production rate per hectare (yield)	95	3	4.2	.06
5. Farmers' investment in agricultural sector	98	4	4.1	.09
6. Contact with governmental agricultural extension agents	98	4	4.1	.06
7. Interest and willingness for continuing farming activities	98	4	4.1	.09
8. The rate of co-operation and friendship with other farmers	95	5	4.0	.07
9. Using pesticides, herbicides etc. in the farm for plant protection	93	5	4.0	.09
10. Using drugs and medicines for controlling and curing common animal disease independently	59	6	3.9	.10
B. Lowest scoring perceived internal changes				
1. Selling agricultural and animal products in the market with a reasonable benefit	98	1	3.4	.10
2. Packaging and food processing of the farmers' products	69	1	3.4	.08
3. Utilizing family members to help farmers on the farm	88	1	3.4	.08
4. Initiating small cottage industries and manufactures on the farm	56	1	3.4	.09
5. Using fertilizers appropriately on the farm	92	2	3.2	.11

Note: [1]Total number of respondents out of 102; [2]Rank; [3]Mean 1= Very unimproved; 2= Slightly unimproved; 3= No difference; 4= Slightly developed; 5= Very developed

3.4.3 Research question 1-2: perceived external changes

External changes were also examined since they can have a considerable influence on farmer behaviour (internal changes) and can therefore indirectly support or hinder a farmer's development.

As in the previous section, 29 questions were asked of farmers to rate their opinions in the questionnaire on a 5-point scale (1= Very unimproved; 2= Slightly unimproved; 3= No difference; 4= Slightly developed; 5=Very developed). Because of the internal consistency of a different group of questions and in order to reduce the data, these questions were merged into nine categories.

The Cronbach's alpha (*α)* was measured for each main component to assure the consistency of those questions. The Cronbach's alpha coefficient for all categories was found to be higher than 0.7 (see second column of table 3.5). All nine categories of perceived external changes rated, on average, between 3.3 and 4.4 on the 5-point scale mentioned. It could be said that on average most of the items have not developed significantly.

More specifically, although farmers did have a good feeling of the development of accessibility of extension and education services (M= 4.4, sd= .06) they were concerned about the changes in price of agricultural inputs (M= 4.1, sd= .06).

Moreover, in their view, very little improvement has occurred in the quality and accessibility of inputs, suitability of lands, appropriateness of national and international agricultural policies, farmers' financial supports, stability of climate (see also Austen et al., 2002) and finally, investment of the private sector in agriculture (3.3 ≥ M ≥ 3.6 , .06 ≥ sd ≥ .49).

Table3.5 Rank, mean, Cronbach's alpha and standard deviation scores of external changes as perceived by farmers

External changes	Q^1	α^2	n^3	r^4	M^5	*SD*
1. Access to extension and education services	1	-	101	1	4.4	.06
2. The price of agricultural inputs	6	.80	102	2	4.1	.06
3. The quality of agricultural inputs	6	.79	102	3	3.6	.06
4. Suitability of lands under cultivation	2	.71	91	3	3.6	.07
5. Accessibility of inputs	6	.75	102	4	3.5	.06
6. Appropriateness of national and international agricultural policies for farmers	2	.79	102	4	3.5	.06
7. Governmental financial support provided to farmers	3	.70	102	5	3.4	.49
8. Stability of climate and atmoshere	1	-	97	6	3.3	.09
9. Investment of private individuals or groups in agricultural sector	1	-	75	6	3.3	.07

Note: [1]Number of questions referring to the item in the questionnaire; [2]Cronbach's alpha coefficient; [3]Total number of respondents out of 102; [4]Rank; [5]Mean 1=Very unimproved; 2=Slightly unimproved; 3=No difference; 4=Slightly developed; 5=Very developed

3.4.4 Research question 2: information sources (IS)

The IS of farmers are also very important in the process of farmer development. There are various sources that farmers regularly use to inform themselves of the phenomena occurring in their environment such as innovations, new opportunities in agriculture, upcoming challenges etc.

To examine the IS that farmers use, 13 questions rated their perceptions on a 5-point scale (0= not at all; 1= seldom; 2= some times; 3= usually; 4= always). The mean scores (M) varied from 0.3 to 3.1. According to table 3.6 "governmental extension agents" were deemed the most important information source for farmers (M= 3.1, sd= .88).

This issue is confirmed in the research of Solano et al. (2003) and also Karbasioun, Mulder and Biemans (2007a; 2007b). But it is not in favour of a number of studies accomplished in Iran by the researcher et al. (e.g. Chizari, Karbasioun & Lindner, 1998; Karbasioun & Mulder, 2004a;

2005; Karbasioun & Chizari, 2004a; 2005; Karbasioun, Mirzaey & Mulder, 2005). The possible reasons for this variance could be the diversity of the target groups in different studies. However, the second and third preferences illustrate "farmers' experience" (M= 2.5, sd= 1.11) and "other farmers" (M= 1.6, sd= 1.16) as the second and third important IS. Farmers claimed mass media (mostly TV and Radio) to be their fifth most used information source (M= 1.2, sd= 1.23).

They did not hold other IS in high regard (1.1 ≥ M ≥ .3, 1.28 ≥ sd ≥ .80) and, as expected, research centres and universities were perceived as the second least important IS for farmers. This lack of linkage between universities, research centres and farmers is a common problem in developing countries and has been reported by various researchers (e.g. above studies; Lacy, 1996; Purrcell & Anderson 1997; Barichello, 2004).

Table 3.6 Rank, mean and standard deviation scores of information sources (IS) used by farmers

Information source	n^1	r^2	M^3	**SD**
1. Governmental Extension Agents	102	1	3.1	.88
2. Experience of farmer	101	2	2.5	1.11
3. Other farmers	99	3	1.6	1.16
4. Non-Governmental Extension Agents	100	4	1.4	1.25
5. Mass media (TV, Radio, Newspapers, etc)	102	5	1.2	1.23
6. Supplier Companies	101	6	1.1	1.28
7. Product buyers	98	7	.9	1.07
8. Agriculture Bank	101	8	.8	1.20
9. Farmer's Employees and workers	101	8	.8	1.15
10. Contract workers	100	9	.7	1.05
11. Financial experts (governmental)	102	10	.5	1.11
12. Research institutes and Universities	102	11	.4	.82
13. Financial experts (non-governmental)	102	12	.3	.80

Note: [1]Total number of respondents out of 102; [2]Rank; [3]Mean: 0 = not at all; 1= seldom; 2= sometimes; 3= usually; 4= always

3.4.5 Research question 3: coping strategies (CS)

First of all, one general question was asked of the farmers to reveal their overall perceptions of the extent to which they have been able to cope with any stressful changes they have experienced. A 5-point scale (1= not at all; 2= A little; 3= Moderately; 4= Very; 5= Very much) was used and the mean of 3.11 (sd= .73) was obtained.

Based on these results, approximately 60% (majority) of the farmers claimed that they have "slightly" coped and the minority (24.7%) cited they have "very" or "very much" coped with the changes. To investigate farmers' CS, 17 questions were asked of respondents on a 5-point scale (0= nothing; 1= a little; 2= slightly; 3= very; 4= very much). The resulting mean scores (M) varied from .3 to 3.0. Table 3.7 illustrates the various CS that farmers use to overcome stressful changes.

Accordingly, farmers ranked extension courses as their first coping method (M= 3.0, sd= 1.06); although, individual meetings with extension agents are also important and were ranked in second place (M= 2.7, sd= 1.04).

The third preference reveals that trial and error (on-the job learning) was another important CS for the farmers (M= 2.4, sd= 1.20) and participation in relevant conventions was assigned as the fourth important CS by farmers (M= 2.2, sd= 1. 30).

Farmers indicated that they have learnt, to a moderate extent, from books, journals, research-extension farms, friends, colleagues, and successful farmers ($1.9 \geq M \geq 1.8$). They have learned "to a little extent" via farmers' study groups, audio-visual materials, private agencies, input suppliers, product buyers, rural councils and their educated children ($1.2 \geq M \geq .7$). Finally, farmers ranked rural youth clubs (M= .3, sd= .78) and e-learning (M= .3, sd= .84) as the two least frequently used CS.

Table 3.7 Rank, mean and standard deviation scores of coping strategies (CS) used by farmers

Coping strategy	n^1	r^2	M^3	SD
1. Taking part in short-term extension courses	101	1	3.0	1.06
2. Support by official extension agents via individual visit	100	2	2.7	1.04
3. Learning by trial and error (on-the job learning)	102	3	2.4	1.20
4. Taking part in conferences, workshops and symposiums	102	4	2.2	1.30
5. Reading professional journals and books	98	5	1.9	1.17
6. Learning by visiting research-extension common farms	98	5	1.9	1.25
7. Learning from friends, colleagues, and relatives	102	6	1.8	.96
8. Getting help from successful farmers	101	6	1.8	1.11
9. Learning through farmers' study groups	101	7	1.2	1.26
10. Using audio-visual materials (video tapes, etc) as self-study tools	101	8	.9	1.07
11. Supported by private agencies	99	9	.8	1.11
12. Learning from input supplier	100	9	.8	.97
13. Learning from product buyers	102	9	.8	.96
14. Getting help from the members of rural council	99	9	.8	1.05
15. Learning from educated children	99	10	.7	.94
16. Taking part in rural (4H) youth clubs	100	11	.3	.78
17. Learning via internet	100	11	.3	.84

Note: [1]Total number of respondents out of 102; [2]Rank; [3]Mean: 0= not at all; 1= a little; 2= moderately; 3= very; 4= very much

3.4.6 Research question 4: correlations

First of all the correlations between farmers' traits and their perceived changes are illustrated below.

3.4.6.1. Farmers' personal and field characteristics with perceived changes

Educational level and irrigated land size were found to have some significant relationships with the perceived changes (internal and external). Kendall's tau (Kt) correlation test was used resulting in the following:

A. Educational level: the more educated farmers had more contact with agricultural specialists in their farming activities (Kt=.192, Sig. = .048, N= 82). They had more communication with private input suppliers (Kt=.221, Sig. = .035, N= 91). They were less satisfied with the availability of hybrid seeds (Kt= -.197, Sig. = .028, N= 94) and governmental supports of rural small industries (Kt= -.291, Sig. = .021, N= 63).

B. Irrigated land size: the farmers with a greater amount of land under irrigation have invested more in the agricultural sector (Kt= .228, Sig. = .013, N= 90), applied better irrigation systems on their farms (Kt= .216, Sig. = .019, N= 90), have been better able to appropriately use hybrid seeds on the farm (Kt= .233, Sig. = .014, N= 90), have hired more labourers to help them farm (Kt= .207, Sig. = .030, N= 84) and have made more contact with agricultural extension personnel (Kt= .224, Sig. = .033, N= 91) in their area. Finally, they have increased the size of land under cultivation (Kt= .251, Sig. = .007, N= 87) significantly in comparison with small-holders.

3.4.6.2. Farmers' personal and field characteristics with IS

To investigate the correlations of farmers' personal traits and field characteristics with IS the Cramer's V (CV) for gender and marital status (nominal variables) and Kendall's tau (Kt) tests for educational level, irrigated land size and categorized age level (ordinal variables) were used.

It should be noted that Cramer's V test is always neutral and doesn't give any positive or negative value but the values given in the paper are revealed through comparison of the results with other tests such as Kendall's tau and Pierson (Kalantari, 2003). The significant results are listed in table 3.8. Solano et al. (2003) also analyzed these correlations in their research and discovered that farmers with different characteristics have different preferences for their information sources.

In this research we found that older farmers viewed supplier companies, contract workers, research centres, universities and governmental financial experts as less important IS than younger farmers. These findings do not support the results of Kivett (1988).

In terms of gender, female farmers applied mass media, supplier companies and governmental financial experts more than males. The fourth column of table 3.8 shows that married farmers, in contrast to bachelors, did not look to the mass media and the agricultural bank as information sources.

The results also uncovered the fact that the farmers with higher education levels had a greater amount of contact with all the IS mentioned in table 3.8 in comparison to the less educated farmers. They were able to establish better contact with intermediary parties such as input suppliers, output buyers, and contract workers.

Also, they used mass media, universities and research centres more than the lesser educated farmers. One significant positive relationship was found between irrigated land size and assuming product buyers as IS (Kt=.220, Sig. = .016, N= 90).

In order to investigate the extent to which different groups of farmers are able to get information from different resources, Chronbach's alpha (*α*) for all "13" IS in table 3.6 was calculated and a value of .82 was obtained, which allows us to make a new variable by combining the 13 aforementioned items.

Therefore, a new collective variable was formulated which indicates that farmers, on average, use IS rarely (M= 1.21, sd= .62). Then, the differences between the various farmer groups (age, educational levels, etc.) and this new key variable were assessed using Kruscal Wallis and Mann-Whitney U (non-parametric) tests. The results showed a significant difference between farmers' age levels (χ^2 = 15.04, df= 3, Sig. = .002) and also educational levels (χ^2 = 24.75, df= 6, Sig. = .000) according to the total IS they use in their farming.

It means that farmers with different education and age levels do not use IS to the same extent. But no significant difference was found between IS usage in general and irrigated and non-irrigated land size, kind of land ownership, gender and marital status of farmers.

Table 3.8 Relationships between personal characteristics of farmers and information sources

Information source	Age	Gender	Marital status	Educational level
	Kt^1 (n)	CV^2 (n)	CV^2 (n)	Kt^1 (n)
1. Mass media	-.225** (99)	.438** (98)	.373** (99)	.246** (101)
2. Supplier companies	-.254** (99)			.394 ** (100)
3. Product buyers				.218* (97)
4. Agricultural bank		.322* (98)	.365* (99)	.295** (100)
5. Contract workers	-.213** (96)			.179* (99)
6. farmer's employees and Workers				.292** (97)
7. Research institutes and Universities	-.256** (100)			.415** (101)
8. Governmental financial Experts	-.254** (99)	.296* (99)		.311** (101)

Note: ^{1}Kt= Kendall's tau Correlation test; ^{2}CV= Cramer's V test; ** = Correlation is significant at the 0.01 level; * = Correlation is significant at the 0.05 level.

3.4.6.3. Farmers' personal and field characteristics with CS

As with information sources (IS), Cramer's V (CV) test for gender and marital status (nominal variables) and Kendall's tau (Kt) test for educational level, irrigated land size and categorized age level (ordinal variables) were used. Results similar to those in the previous section were achieved and are shown in Table (3.9). Looking at the second column of table (3.9), it is seen that older farmers used less agricultural journals and books; got little help from friends, colleagues and relatives; participated less in farmers' study groups; and received a lower extent of support from private agencies. They likewise, used, in small proportions, the internet and rural youth clubs as their CS. The relationship between educational level and CS for all listed items in the table was positively significant except for item six (support from private agencies) and item ten (attendance in rural youth clubs). Thus, more educated farmers have been clearly able to use various CS such as using journals and books, actively participating in study groups and communicating with different farmer groups; applying self study materials, learning from product buyers and input suppliers and using the internet. These findings are supported by

Austen et al. (2002) who found a positive relationship between educational level and use of information technology as CS in his research.

Moreover, the farmers with a bigger land size were better able to cope with the changes in and around their farms over the years (Kt= .204*, Sig. = .028, N= 90); they used more trial and error to cope with changes (Kt=.254, Sig. = .0013, N= 94); they learned more from input suppliers (Kt= .220, Sig. = .0035, N= 92); but they participated less in rural youth clubs (Kt= -.214, Sig. = .039, N= 93).

The results also illustrated that females participated less in farmers' associations and groups (CV= .336, Sig. = .025, N= 99); they read more professional journals and books (CV= .324, Sig. = .039, N= 96) and established more contacts with extension personnel in extension centres compared with their male counterparts (CV=.337, Sig. = .025, N= 98). Finally, married farmers, placed "farmers associations" as more important (CV=.321, Sig. = .035, N= 100) as opposed to "support from private agencies" (CV= .328, Sig. = .032, N= 98) and input suppliers (CV= .321, Sig. = .034, N= 101) which they deemed less important in their CS.

Again, similarly to information sources (IS), in order to explore the rate of success or failure of different groups of farmers in coping with the changes, Chronbach's alpha (*α)* for all "17" investigated CS listed in table 3.7 were measured and the value of .79 was achieved. Then all items were combined and a new key variable was calculated, which indicated that farmers, on average, have coped between a moderate and to a little extent (M= 1.44, sd= .52) with changes. Then, based on this new variable the differences between farmers' personal and field traits were examined using Kruscal Wallis and Mann-Whitney U (non-parametric) tests.
Similar to previous results, significant differences between the farmers' age levels (χ^2 = 7.41, df= 3, Sig. = .060) and also educational levels (χ^2 = 13.34, df= 6, Sig. = .038) and their overall CS used, were found which means these two groups of farmers deal with coping strategies differently. But no significant differences were achieved between irrigated/non-irrigated land size, kind of land ownership, gender, and marital status with regard to the total applied CS. Finally, the correlation between the total farmers' CS and total IS (sum up of 17 different CS and sum up of 13 different IS) was calculated and a high significant association was obtained which implies that the use of IS and CS are more or less analogous. (Kt= .421, Sig. = .000, N= 102).

Table 3.9 Relationships between age and educational level of farmers and their coping strategies

Coping strategy	Age	Educational level
	Kt^1 (n)	Kt^1 (n)
1. Reading professional journals and books	-.172* (97)	.348** (98)
2. Learning from friends, colleagues, and relatives	-.191* (100)	.225** (101)
3. Getting help from successful farmers		.172* (100)
4. Learning through farmers' study groups	-.191* (100)	.271** (100)
5. Using audio-visual materials (CD-ROMs, videotapes, etc) as self study tools		.177 * (100)
6. Supported by private agencies	-.230** (98)	
7. Learning from input suppliers		.182* (99)
8. Learning from product buyers		.224** (101)
9. Learning via internet	-.233** (99)	.223* (99)
10. Taking part in rural (4H) youth clubs	-.111** (99)	

Note: [1]Kt= Kendall's tau Correlation test; **= Correlation is significant at the 0.01 level
* = Correlation is significant at the 0.05 level

3.4.7 Research question 5: The implications of the study for the competency profile of AEIs?

These findings focus AES' attention on the farmers' perceived internal changes, particularly the least developed items and to address these aspects in the extension courses they present. Obviously AEIs are expected to enrich their competencies to address those internal changes as much as possible. The distinguished competencies should vary based on the different course topics and farmer specialties. With regard to external changes, because they indirectly impact on farmers' success or failure, and also all extension programs, it seems essential for AEIs to have the competency of assessment and recognition of those external changes and also the capability of communication with correspondent organizations for appropriate reaction. Thus, it is recommended that those competencies are tailored in the competency profile of AEIs (see also Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c).

It was seen that AES/AEIs are still considered a trustworthy IS for participant farmers in extension courses (the target group). Nevertheless, there is room for improvement and AEIs are assumed to be able to broaden the accessibility of farmers to IS and to eliminate the barriers that hinder the use of suitable IS by farmers. Interestingly, governmental AES/AEIs were perceived as the most important CS for farmers in this study. However, the vital role of AES/AEIs would be to raise the usability and accessibility of different CS particularly the ones that are more independently applicable to farmers. So, AES/AEIs should not only help farmers to overcome severe problems in their career, but they are also expected to teach them how to get access to different potential CS and benefit from them intellectually.

Finally, the relationships that were found in this study reiterate that AES/AEIs' programs should take the tendency of farmers' groups, specifically different age and educational levels into consideration by adjusting the programs with farmers' groups in terms of complexity, simplicity, educational methods etc. Hence, predicting the possible behaviour of these different groups based on their way of handling changes and their application of IS and CS would be of great importance because, according to the correlation results, both education, and age level in particular, play a vital role in farmers' behaviour (see also Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c; Bageri & Shahbazi, 2003; Hemimlich, 1996).

3.5 Conclusions and discussion

The majority of farmers in this study were older, poorly educated, married, and smallholders lacking job diversity on their farms. With regard to the latter there is the potential to encourage new and supplementary activities in rural areas if there is a reasonable investment by the government, semi-private or private sectors. The results here support other studies where the researchers stress heterogeneous resource productivity in rural regions, particularly in less-favoured areas, and conclude that enabling farmers to benefit from potential farm or non-farm activities in order to enhance their income is indispensable (Chaplin & Gorton, 2004; Ruben & Pender, 2004).

Likewise, there is the possibility of improvement in all of the perceived internal and external changes discussed before. Therefore, conscious program planning will result in a considerable improvement in the overall aforementioned internal and external changes in the future. Needless to say that the MAJ can make positive external changes more easily in comparison to internal changes, which are more farmer-related.

Concerning perceived external changes, farmers unanimously stressed the "*high price*" of agricultural inputs. Along with raising the price, "*accessibility and quality of agricultural inputs*" have been moderately improved over the years with the exception of fertilizers. So, it is suggested that the MAJ should, to a larger extent, attempt to control the price of inputs and increase the quality and accessibility of inputs. As a result of the increased price of inputs, farmers cannot afford to buy and use them adequately on their farms.

This research reveals that farmers perceive governmental extension agents as the most important information source. This fact was also confirmed by other recent studies undertaken by the researcher et al. (Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c). The farmers' own experience and other farmers were considered as the second and third most important IS with mass media as the fifth. This is because although TV and radio should be expected to play more dominant roles for information delivery to farmers apparently they mostly offer general, rather than farm-related, programs.

Additionally, the relationship between farmers, input suppliers and product buyers is only a business transaction with very little information exchanged in the process. It implies that individual mediators or companies are probably not aware of the fact that they can noticeably increase farmers' effectiveness and production; and as a result, enhance their own benefits via information delivery to farmers. More importantly, there is little remarkable communication between farmers, universities, and research centres to support farmers with new knowledge and technology. Although the Ministry of Agricultural-Jihad (MAJ) has made efforts to develop this relationship, our research revealed that it is still insufficient. The Ministry should be encouraged to discover why this association is weak.

Our study showed that farmers do not consider their educated children in the field of agriculture as a trustworthy IS and this is probably due to their low position and age in the family, and also because of shortages of their information and competencies. This is not certain yet. Hence, further research is suggested to give more insight into this interesting issue. Our research also showed that private extension agents are still not a predominant IS for farmers. Despite the fact that the Ministry of Agricultural-Jihad (2002) has emphasized the privatization of extension services in recent years, it seems to be too early to materialize this new strategy of AES, at least in the short-term.

Participation of farmers in different agricultural conventions and also reading written technical materials has been assigned as the fourth and fifth CS (not commonly used). Farmers do very little self-study and only use audio-visual educational instruments to a small extent. These issues could be as a consequence of their lack of sufficient education and also their low access to instructional tools and self-study materials. In addition, they ranked rural youth clubs and e-learning as the least frequently used CS. Farmers' age perhaps is the major reason for not participating in those clubs.

Furthermore, lacking adequate facilities, financial shortcomings, traditional beliefs and being poorly educated could be the main reasons that farmers do not use the internet. The results of the inferential analyses underline the vital role of education and age and also the size of irrigated lands in farmers' behaviour concerning changes, CS and IS as it was already confirmed in the other studies of the larger project (see Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c).

It was seen that older, lower educated and small-holder farmers have more difficulties in coping with changes, enhancing their information and skills, and being communicative and active in their area. Also, females participated less in public programs and farmers' associations which is possibly more religious or culture related. Therefore, AEIs should have the competencies of supporting different groups based on their particular problems and characteristics. For example, provide a convenient environment for women to increase their participation in the courses etc.

With regard to the results of this study, it is concluded that governmental AES is assumed as the most important IS and also CS for farmers. Although farmers rely on other supporters and assistants such as other farmers, relatives, friends, and so on, none of them are in the same position as the government. So, these findings clearly define the trustworthiness of the governmental programs and its agents for farmers.

Nevertheless, they still expect much more support from AES to overcome their crucial difficulties and enhance their competencies to handle internal and external changes. They are not able to benefit from a wide range of IS and CS on their own and this point, in particular, indicates the necessity of applying a common agricultural extension approach for agricultural extension in Esfahan.

The findings also suggest the need to pay more attention to human resource development (HRD) and management (HRM) in the field of agriculture and particularly accentuate the need for developing the competencies of HR professionals as official farmer supporters. Consequently, developing job competency profiles for the personnel involved in AES, especially for AEIs, will be imperative. So, it is recommended that the competency job profiles of different groups of personnel of the Ministry of agricultural-Jihad are investigated in further research.

Chapter four

The Perceived Value of the Support of Agricultural Extension in Esfahan♣

4.1 Introduction

The major roles of agricultural extension are "transferring information from the global knowledge base and from local research to farmers, enabling them to clarify their own goals and possibilities, educating them on how to make better decisions, and stimulating desirable agricultural development" (NAADS, 2004, p.143; see also Van den Ban & Hawkins, 1996). According to Nagel (1998, p.44):

> "Extension may substitute over a certain period activities such as vocational education that are not yet in place, but more important will be the teaching of managerial and organizational skills that will enable farmers to increasingly solve their own problems. Human resource development thus aims at what may be called "*critical competence*". Extension clients know what to ask for, they can evaluate the appropriateness of technical information, and they are responsible decision makers. Persons with this qualification exist in every rural community, and they will be the ones who actively seek further assistance. One important task of any extension system will therefore be to extend human resource development to underprivileged groups with less access to formal or vocational education – women farmers, rural youth, and generally small farmers in remote areas."

In this respect, various alternative extension approaches are possible such as:

> "public versus private, government versus non-government, top-down (bureaucratic) versus bottom-up (participatory), profit versus non-profit, free versus cost-recovery, general versus sector, multipurpose versus single purpose, and technology-driven versus need-oriented. In practice, extension organizations everywhere pursue the overall goals of technology transfer and human resource development, though the emphasis will differ" (Nagel, 1998, p.45).

Several extension experts have introduced different approaches (often used in combination with other approaches) for implementing agricultural extension and supporting farmers. These approaches can be characterized as ministry-based or general, commodity-based, university-based, training and visit (T&V), integrated or project-based, animation rural, client-based and client-controlled, extension as a commercial service, participatory or privatized extension (Baxter, Slade & Howell, 1989; Benor & Harrison, 1977; Nagel et al., 1992; Rauch, 1993; Umali & Schwartz, 1994). In Iran, and many other developing countries, a combined approach is used with a focus on the ministry-based extension system.

Additionally, to materialize the adopted extension approach, different extension methods are used. The following extension methods can be discerned: individual methods (individual farm visits, telephone calls, postal letters, emails, etc.), group methods (group discussion sessions, extension courses, method and result demonstrations, etc.) and mass media (TV, radio, field days, etc.) (Campbell & Barker, 1998; Prawl, Medlin & Gross, 1984; Rathore et al., 2001; Swanson, 1984). In the present study, these methods are referred to as information sources of farmers and the importance of these information sources is examined. Other researchers (e.g. Errington, 1986; Ferreira, 1997; Gasson, 1973) proposed different criteria to classify information sources, e.g. internal and external (depending on the origin), direct observation, verbal and written information (depending on the medium), and recorded numerical data, comments from people and the decision maker's own past experience (depending on the source).

It is clear that extension does not only involve delivering information to farmers but should also attempt to make farmers creative, self-confident and competent enough to overcome their own problems and dilemmas (Sulaiman & Hall, 2003). To meet this intention, agricultural extension specialists need to prioritize their interventions, fine-tune their methodological approaches, and select efficient support strategies to serve the needs of farmers within specific environmental and socio-economic settings (Patanothai, 1997). Leeuwis and Van den Ban (2004) also stressed these trends and discussed the need to forge linkages and form networks within and across different organizations and AESs, to recognize and aim for win-win situations for all players and actors involved, and to be aware of opportunities for change. Moreover, national and international developments with respect to the demand for food, competition, research and innovation, employment opportunities, governmental support for agricultural products and so on have many implications for agricultural extension itself (Van den Ban, 1996). Extension specialists such as Rivera and Zijp (2002) have severely criticized traditional AES and described it as a Jurassic Park with limited value for spectators, where it's protected dinosaur-like approaches and practices are kept alive as clumsy beasts that are woefully misaligned with today's realities, having no chance of survival without adequate protection. They then present 18 case studies of contracting for agricultural extension delivery as an emerging form of AES. Ison and Russell (2000) mentioned the need to look at the management of the relationship between rural communities and AES and particularly research and development (R&D) agencies.

In Iran, AES officially started more than 50 years ago, following the basic philosophy for the existence of extension services, and from that time significant efforts have been made to make farmers more productive, healthy and prosperous through applying appropriate extension programs. Despite the attempts by AES to alleviate rural poverty and support farmers to improve their competencies in different aspects of their job and also to be more responsible with environmental and natural resources, there are indications that the efficiency and the quality of the support provided by AES has not been enough to serve farmers' needs.

4.2 Theoretical framework

As mentioned above, AES have been struggling to support farmers by applying various strategies and approaches in countries throughout the world. Several significant positive results in agricultural rural development have been achieved, as shown by evaluation studies. Nevertheless, serious points of criticism have been raised by many researchers referring to the un-sustainability and inefficacy of AES (Sofranko, 1988). Many reasons have been mentioned for the ineffectiveness of AES such as: financial shortages, the frequent encumbrance of extension agents with public duties beyond those related to knowledge transfer, lack of linkage between research and extension, attention to big-farmers instead of small-farmers, large scale and complexity of extension operations, weak political commitment and support, non-participatory approaches, shortage of training, incentives and inadequate competencies of extension employees, low percentage of farmers who have contact with AES personnel, and difficulties of access to poor farmers (Anderson & Feder, 2004; Baliscan & Pernia, 2002; Bunch, 2000; Ozcatalbas, Brumfield & Ozcan, 2004; Nitsch, 1988; Sofranko, 1988).

Studies in Iran also showed the above-mentioned problems. For instance, Kalantari (1995, p.9) mentioned the following problems to be taken into account by AES in Iran if they are to be effective:

> "Small size agricultural lands and production scales; the restrictive macro policies in the agricultural sector; low quality of products and low technical skills of farmers; financial difficulties of the majority of farmers; the need for greater investment in infrastructure; the transfer of capital from the agricultural sector to other sectors; inefficiency of public service in promoting agricultural infrastructures; inadequacy of research and training works and extension schemes; etc."

In addition, Chizari, Lindner and Lashkarara (2001, p.65) reported that:

> "Major barriers hampering adoption of sustainable agriculture practices included: limited financial returns for farmers, limited farmer knowledge of sustainable agriculture principles and methods, low levels of farmer education, government rules and regulations, problems with soil erosion and lack of water, and a low level of extension agent knowledge with respect to sustainable agriculture."

Malek-Mohammadi (1989) examined the role of AES in agricultural development in Iran. Respondents in his study were experts, extension agents, and specialists who were selected based on their level of formal education, length of experience and who were known as active and creative agents. According to his findings, the influence of AES on agricultural development still is relatively high although the agricultural extension system is not very progressive. In this respect, Karbasioun and Mulder (2004b) and Karbasioun, Mirzaei and Mulder (2005) showed that AES in Iran is suffering from malfunctions in the area of human resource management and development.

Numerous extension programs have been provided to farmers and land users by the Ministry of Agriculture, in several cases in co-operation with other organizations such as the Red Cross, national youth organizations, etc. Despite the fact that an integrated evaluation system has been connected to the implementation of these programs, the evaluation results have not yet resulted in significant changes of the AES programs (Karbasioun, Mirzaei & Mulder, 2005). Many other researchers have also focused on the aims and roles of AES in light of the agricultural development of Iran and have reported similar findings (Agasizadeh & Shahbazi, 1995; Beygi, Zarafshani & Chizari, 2000; Chizari, Karbasioun & Lindner, 1998; Chizari & Mirikhoozani, 1995; Darvishi, 2003; Hejazi, 1989; Heidari, 2000; Karami, 2001; Karami, 1982; Karami, 1995; Karbasioun & Chizari, 2004; Lotfi, 2004; Ministry of Jahad-e-Keshavarzi, 2002; Najafi, 1991; Pezeshki-Raad, Aghai & Ukaga, 2001; Pezeshki-Raad, 1993; Pezeshki-Raad & Aghai, 2002; Pezeshki-Raad, Aghai & Ukaga, 2001; Zamani, 2000; Zarafshani, 2002). Most of these studies, however, have concentrated on the support provided by AES to farmers in the past and not on the support that should be provided in the future.

4.3 Purpose and research questions

The study described in this chapter is built upon the findings of a pilot study that revealed that farmers had serious difficulties in coping with the negative changes and problems that happened on their farms. Most of the time they had to overcome these changes and problems just by relying on their own initiative, relatives, and friends without adequate support from AES (Karbasioun & Mulder, 2004a).

The current study was aimed at exploring the kinds of support that AES has provided to farmers in the past and the kinds of support that AES is expected to provide in the future (the forthcoming five years) to empower farmers in their farming activities. In this respect, the perceptions of farmers as the audience of AES took a central position. Farmers' information sources about AES programs and farmers' perceptions of the usefulness of recent AES programs carried out by the Ministry of Agriculture in their region were examined as well.

Moreover, the relations between farmers' personal characteristics and their information sources and preferred kinds of AES support were explored. Implications for competencies of agricultural extension instructors (AEIs), who are supposed to support farmers on behalf of AES, are discussed. The current study is part of a bigger research project aimed at designing a job competency profile for AEIs in Iran.

4.4 Methods and data sources

As already stated, the research methods here are the same as those in the previous chapter and are therefore not repeated. Only the structure of the final questionnaire is listed as the following (numbers of questions for each topic are mentioned between brackets):

demographic profile of the farmers (8); products of the farm (7); information about AES programs (1); information sources regarding AES programs (13); kinds of support already provided by AES (39); kinds of support expected to be provided by AES (39); perceptions of the usefulness of recent AES programs (9). The final questionnaire included open and closed (using a five-point Likert scale) questions.

4.5 Results

The demographic profile of farmers in chapter three still stands for this study and is therefore not repeated here. In reaction to the question to what extent are farmers informed about AES programs, table 4.1 shows that about 80% of the selected farmers have usually or always been informed about AES programs (M = 4.0; SD = 0.9). Only 6.2% of respondents reported that they have seldom or never been informed about AES programs.

Table 4.1 Distribution of farmers' perceptions of the extent to which they have been informed about the AES programs carried out by the Ministry of Agriculture (n = 95)

Response	*f*	*%*	*Cum %*
Not at all (1)	1	1.0	1.0
Seldom (2)	5	5.2	6.2
Sometimes (3)	13	13.4	19.6
Usually (4)	50	51.5	71.1
Always (5)	28	28.9	100.0

The farmers were also questioned about the information sources they used to get informed about AES programs in their area. As Table 4.2 indicates, the two most important information sources according to the farmers were governmental extension agents and their own experiences.

Other information sources (items 3 to 13) were less important for farmers. In this respect, research institutes and universities and (non-) governmental financial experts were perceived as the least important information sources by the farmers.

Table 4.2 Farmers' perceptions of the importance of various information sources on AES Programs

Information source	n	M	SD
Governmental extension agents	101	3.1	1.0
Own experiences	101	2.6	0.9
Other farmers (friends, partners, neighbours, etc.)	100	1.4	1.1
Mass Media (TV, radio, newspapers, etc.)	100	1.3	1.2
Non-governmental extension agents	99	1.3	1.1
Supplier companies	100	0.7	1.0
Product buyers	100	0.6	1.0
Contract workers	97	0.6	0.9
Farmer's employees and workers	99	0.6	0.9
Agricultural bank	100	0.6	1.0
Research institutes and universities	101	0.4	0.9
Financial experts (governmental)	101	0.3	0.8
Non-governmental financial experts	101	0.2	0.6

Note: Scale: 0= not at all; 1= seldom; 2= sometimes; 3= usually; 4= always.

Additionally, possible relationships between farmers' personal characteristics and their information sources were examined (Table 4.3). Older farmers considered mass media, supplier companies, contract workers, research institutes and universities, and governmental financial experts as less important than younger farmers.

Educated farmers considered such information sources as more important than less educated farmers. Moreover, a significant negative relationship between farmers' irrigated land size and perceived importance of governmental financial experts ($Kt = -.21$, $p \leq 0.05$; $n = 93$) was found.

Table 4.3 Correlations between perceived importance of different information sources and farmers' age and educational level

Information source	Age		Educational level	
	Kt	*n*	*Kt*	*n*
Mass media (TV, radio, etc.)	-.23*	99	.36*	100
Supplier companies	-.25*	99	.29*	100
Product buyers			.22*	100
Contract workers	-.21*	96	.19*	97
Farmer's employees and workers			.17*	99
Research institutes and universities	-.26*	100	.37*	101
Financial experts (governmental)	-.16*	100	.29*	100

Note: *Kt*= Kendal tau correlation test.; * $p \leq 0.05$.

The kinds of support farmers have received from AES during the past years and the kinds of support that farmers expect from AES in the future were examined through 2 sets of 39 questions covering various aspects of the farmers' work. Using Cronbach's alpha reliability test, the questions were clustered into 10 categories (Table 4.4).

To examine the gap between past and future supports, mean discrepancy scores were calculated (column D). In general, the farmers claimed that AES has supported them only a little or moderately in the past. They mentioned that AES has focused, to some extent, on animal husbandry and veterinary, agricultural inputs and enhancement of the fertility and size of the farms. According to the farmers, AES has paid the least attention to improving the marketability of agricultural and animal products and to initiating small cottage industry and manufacturing near the farm.

With respect to farmers' expectations from AES in the future, in general, they stressed that much support will be needed. According to the farmers, the most important kinds of future support are related to making an agricultural career more satisfactory for farmers and to reducing the risk, labour and severity of farming. The least important kinds of future support are related to initiating small cottage industry and manufacturing near the farm and attending properly to animal husbandry and veterinary services. The discrepancies between the means for

future and past supports show that "making an agricultural career more satisfactory for farmers," "reducing the risk, labour and severity of farming" and "improving the marketability of agricultural and animal products" are the kinds of support that are relatively more important for farmers in the future.

Table 4.4 Farmers' perceptions of the kinds of AES support provided in the past and the kinds of support that should be provided by AES in the future

Kinds of support provided by AES (in the past)	n	Q[a]	α[b]	M[c]	SD	D[d]
Practicing animal husbandry and veterinary properly	62	2	0.94	2.0	1.1	-
Using agricultural inputs on the farm appropriately	53	8	0.86	1.9	0.7	-
Increasing yield through enhancement of the fertility and size of the farms	88	3	0.72	1.9	0.8	-
Improving the socialization process of farmers	54	14	0.93	1.8	0.7	-
Making an agricultural career more satisfactory for farmers	98	1	_	1.7	1.0	-
Helping farmers to apply new technology on the farm	94	1	_	1.7	0.8	-
Implementing sustainable agriculture	97	1	_	1.6	0.8	-
Reducing the risk, labour and severity of farming	95	2	0.76	1.6	0.8	-
Improving the marketability of agricultural and animal products	70	6	0.81	1.4	0.6	-
Initiating small cottage industry and manufacturing near the farm	70	1	_	1.1	0.9	-
Kinds of support to be provided by AES (in the future)	**n**	**Q[a]**	**A[b]**	**M[c]**	**SD**	**D[d]**
Making an agricultural career more satisfactory for farmers	95	1	_	3.5	0.7	1.8
Reducing the risk, labour and severity of farming	92	2	0.71	3.4	0.6	1.8
Implementing sustainable agriculture	96	1	_	3.3	0.9	1.7
Helping farmers to apply new technology on the farm	96	1	_	3.3	0.9	1.6
Increasing yield through enhancement of the fertility and size of the farms	95	3	0.74	3.3	0.9	1.4
Improving the socialization process of farmers	65	14	0.91	3.2	0.6	1.4
Improving the marketability of agricultural and animal products	80	6	0.85	3.2	0.7	1.8
Using agricultural inputs on the farm appropriately	76	8	0.78	3.2	0.7	1.3
Initiating small cottage industry and manufacturing near the farm	84	1	_	2.6	1.2	1.5
Practicing animal husbandry and veterinary properly	84	2	0.99	2.4	1.8	0.4

Note: [a]Number of questions; [b]Cronbach's alpha; [c]Scale: 0 = nothing, 1 = a little, 2 = moderately, 3 = much, 4 = very much; [d]Discrepancy of means (kinds of AES support in the future and in the past).

Relationships between farmers' personal characteristics and the kinds of support they expect from AES in the future were examined as well (Table 4.5). Older farmers appeared to need more future support to make their career satisfactory than younger farmers. They expressed less interest in initiating small industries near the farm. Educated farmers expected more future AES support than less educated farmers when it concerned implementation of sustainable agriculture, improving their socialization process and improving the marketability of agricultural and animal products. Finally, farmers who possessed bigger irrigated lands were more interested in receiving help in using agricultural inputs on the farm (Kt = .23, $p \leq 0.05$; n = 68).

Table 4.5 Correlations between kinds of support expected from AES in the future and farmers' age and educational level

Kinds of support to be provided by AES in the future	Age		Educational level	
	Kt	*n*	*Kt*	*n*
Making an agricultural career more satisfactory for farmers	.19*	94		
Implementing sustainable agriculture			.33*	79
Improving the socialization process of farmers			.25*	64
Improving the marketability of agricultural and animal products			.30*	95
Initiating small cottage industry and manufacturing near the farm	-.19*	83		

Note: *Kt*= Kendal tau correlation test.; * $p \leq 0.05$

Finally, farmers' perceptions of the usefulness of nine recent AES programs (carried out by the Ministry of Agriculture) in their region were examined (Table 4.6). The farmers were generally satisfied with the short-term extension courses offered in different disciplines over the last ten years and they regarded these programs as useful. They were moderately positive about the role of extension centres in delivering agricultural inputs, key farmers, research-extension common farms, and the policy of offering awards to rural models. On the other hand, according to farmers, constructional army and construction (Basij) groups did not have a significant added value (many farmers were not even familiar with these extension programs as illustrated by the number of respondents). Finally, the farmers expressed that rural Islamic councils and rural (4H) youth clubs were hardly useful for them.

To examine possible relationships between farmers' personal characteristics and their perceptions of the usefulness of AES programs, the nine items in the table were recoded into three main levels of satisfaction with extension programs (low, moderate and high); the item scores were combined into one new variable (satisfaction with extension programs; $\alpha = 0.72$). Then, a Kruscal Wallis test for nominal and ordinal variables (gender, land size, educational level, etc.) and an *F*-test (ANOVA one-way) for interval variables (age) were carried out. No significant differences were found between different farmer groups with respect to the level of satisfaction with AES programs.

Table 4.6 Farmers' perceptions of the usefulness of recent AES programs

Extension program	*n*	*M*	*SD*
Short-term extension courses offered in different disciplines	98	2.9	0.9
Delivering agricultural inputs (pesticides, fertilisers, seeds, etc.)	75	2.2	1.0
Key farmers (contact farmers)	80	2.2	1.0
Research-extension common farms	72	2.1	1.2
Offering awards to rural models	78	2.1	1.2
Constructional army	51	1.2	1.2
Basij (construction) groups	56	1.2	1.3
Rural Islamic councils	78	0.9	1.1
Rural (4H) youth clubs	44	0.7	1.2

Note: Scale: 0= nothing; 1= a little; 2= moderately; 3= much; 4= very much.

4.6 Conclusions and discussion

Based on the results of this study, several conclusions can be drawn. First, the majority of farmers have usually or always been informed about AES programs. The interviews revealed that there is a group of farmers who have close contact with extension personnel. These farmers are informed about AES programs at an early stage and benefit most from these programs. On the other hand, not all farmers in Iran have easy access to extension programs. At this point, it should be noted that all farmers in this study had participated in AES courses

before. In a pilot study carried out by the first author, however, respondents were mainly non-participants in extension courses: in this case, an overwhelming majority of the farmers claimed that they had seldom been informed about extension programs in their region (Karbasioun & Mulder, 2004a).

The two information sources that farmers use most to get informed about AES programs are governmental extension agents and their own experiences. This finding shows that the farmers in this study (participants in AES programs) do not only rely on AES personnel for information about AES programs but also depend on their own experiences and curiosity (this is not the case for farmers in general as mentioned in the previous paragraph).

However, AES personnel and AEIs are considered as the most important information sources by farmers. AEIs should be sufficiently competent to guide farmers through other potentially relevant information sources such as research centres and universities or mass media. These other information sources are often not used spontaneously by many farmers.

Older farmers appeared to consider mass media, supplier companies, contract workers, research institutes and universities and governmental financial experts as less important than younger farmers. Educated farmers consider such information sources as more important than less educated farmers. These findings support the idea that AEIs need different competencies to serve the needs of farmers with different educational and age levels. Thus, in designing a competency profile for AEIs, stratification of target groups of farmers is needed.

The farmers claimed that AES has only supported them to some extent in the past; for the future, they expressed that they will need much more support. They stated that AES used to concentrate on animal husbandry and veterinary, agricultural inputs and enhancement of the fertility and size of the farms. In the years to come, however, the focus should be more on making an agricultural career more satisfactory for farmers, on reducing the risk, labour and severity of farming and on improving the marketability of agricultural and animal products.

Farmers expect AES to support them not only in terms of technical information delivery but also with respect to socialization competencies and emotional aspects (Table 4.4). This shows

the multi-functionality of the roles of AEIs and the necessity of developing their competencies both in technical and general domains.

As mentioned before, older farmers appeared to need more future support, than younger farmers, to make their career satisfactory. They expressed less interest in initiating small industries near the farm. Educated farmers expected more future AES support than less educated farmers with regard to implementation of sustainable agriculture, improving their socialization process and improving the marketability of agricultural and animal products. These results again indicate that the competency profile of AEIs should be tailored to the farmers' age and educational level: different AEI competencies are needed to address the problems and demands of different groups of farmers.

Finally, the results of this study (and the pilot study mentioned before) uncovered that, although AES has tried to be in contact with farmers, has organized different supportive programs and has realized good results with short-term extension courses offered in different disciplines over the last ten years (according to the farmers), this has not led to satisfactory results for other extension programs yet. Many farmers are not yet convinced of the usefulness of a number of extension programs which have been implemented in their villages. In general, this study shows that farmers nowadays feel a strong need for the support provided by AES. In other words, they are more than ever aware of the fact that there is a big gap between their current and ideal situation and they feel that some capacities are still unused on their farms. Although they have done their best in the past, they feel that it will be very difficult to be successful as farmers in the future without help from AES. In this respect, farmers expect to receive help from the Ministry of Agriculture. According to them, in the past they have been forgotten and neglected by the government; whereas other non-productive careers have been especially considered and supported by policymakers (Karbasioun & Mulder, 2004a). In this respect, AES can be advised to use a more participatory approach.

When a more participatory approach is adopted, the farmers will be increasingly willing to cooperate with the extension personnel and will be acquainted with the limitations and strengths of AES in a reciprocal manner. In addition, the usefulness, feasibility and practicality of AES supports in the forthcoming years will be fostered.

Chapter five

Course Experiences of Farmers and the Added Value for

Farming in Esfahan[*]

5.1 Introduction

An important part of the agricultural extension service in Iran is the provision of courses to farmers. Agricultural extension instructors (AEIs) do not receive any specific training before they are asked to teach the courses nor are there special arrangements for professional development. Course instructors, who deliver essential information and skills to farmers during short-term courses, develop their teaching skills in practice. If they receive less than positive evaluations, they are replaced by other candidates, just like in commercial training settings. Through this selection, the final quality of the AEIs is relatively high, but there is a considerable trade-off with the selection of these professionals. The general idea is that through appropriate preparation of extension workers for the role of instructors, the selection process and overall organization of the courses would be more cost-effective.

Because there are no specific training programs for AEIs, these would have to be developed. A first step in that process is to conduct a needs assessment, and to design a job competency model for the extension instructor. The instruction can be conceived of as a human resource development role (HRD), and thus, the methodology to develop competency profiles for HRD professionals can be employed. This has been done recently for the purchasing profession (Mulder, Wesselink & Bruijstens, 2005), but also for the extension profession in Korea (Shim, 2006). Whereas these studies concentrated on analyses of expert opinions and interviews with job holders and broad roles, the present study on the development of a competency profile for extension instructors included an analysis of the experiences and perceptions of the target group of the extension instructors, i.e. the farmers. This is particularly relevant for evaluating the question as to whether the competency profile should be differentiated according to the heterogeneity in the needs of the target group, or whether it could be sufficient to use one comprehensive competency profile.

The competency profile in turn could be used as a basis for the design of a curriculum for training extension professionals. For this, there are other sources too, of course, such as educational programs that are already available, principles and methods of extension (Van den Ban, 1996; Van den Ban & Hawkins, 1996), and adult education theories and principles. These theories and methods can be used in order to achieve effective farmer participation in extension and education programs, and powerful learning. Theories suggest that adult learners tend to seek information that matches their societal roles, that they go to the places where they feel comfortable, places that are non-intimidating, user friendly, and in which others speak their

language, that of the uninitiated public. Therefore, the tendency is that adult learners appreciate being in an informal and familiar atmosphere, free from the pressures of the formal learning environment (Heimlich, 1996; Cerf & Hemidy, 1999; Kilpatrick & Rosenblatt, 1998; Knowles, 1978; Seaman & Fellenz, 1989). The study of Karbasioun, Mirzaei & Mulder (2005) also points at the power of informal learning over formal courses. So, courses for professional development of AEIs should be based on these notions to a large extent. Various extension programs have been carried out by the agricultural extension organization (AEO) in Iran using techniques such as farm visits, key farmers, constructional army, Basij (construction) groups, and rural councils. (Heidari, 2000; Heidari, 2003). Along with these programs, various extension courses have been provided for farmers in which AEIs are involved by the Ministry of Agricultural-Jihad (MAJ), in co-operation with some other organizations (Karbasioun, Mirzaei & Mulder, 2005). Many studies showed that extension courses have added value for farmers; nevertheless, a number of obstacles in the implementation process of these courses have decreased their effectiveness (e.g. Arabzadeh, 1997; Chizari & Karbasioun & Lindner,1998; Karbasioun & Chizari, 2004a; 2005; Karbasioun, Mirzaei & Mulder, 2005; Karbasioun & Mulder, 2005; Karbasioun, Mulder & Biemans, 2007a; Keshavarz, 1994; Zamani & Talebianpour, 2001).

Barriers identified in the studies mentioned above are partly of a physical and partly of a psychological nature. For instance, Arabzadeh (1997) showed that although extension training programs (courses) have had positive effects, they are confronted with some difficulties that hinder their success. He listed major negative factors such as the inappropriateness of the classroom environment (such as light, seating, and ventilation), shortage of instructional technology tools, the existence of incompetent instructors, and the lack of scientific visits from successful farms and local manufacturers. Chizari et al. (1998), in their study, also investigated the most crucial obstacles in extension courses. They discovered ten main constraints for the implementation of extension courses such as lack of facilities for practical teaching, incompatibility of participants' combination in terms of age, gender and career, and the lack of linkage between instructors of the courses with research centres. Moreover, they showed that AEIs lack various technical and general competencies[2]. Karbasioun et al. (2005) in their recent research underlined the positive effects of extension courses on farmers' job status. However, they reported that these courses suffer from low level farmer motivation, lack of follow-up and continuity of training programs for farmers, shortage of funds allocated to the courses, and inadequate attention paid to personal characteristics of farmers in designing extension courses.

5.2 Purpose and objectives

To come back to the main point of this study, which is the analysis of farmers' experiences with, and perceptions of, courses and instructors in Esfahan province, there is very little information about this topic so far. As said, this study is a part of a bigger project that aims at designing a competency profile for AEIs. In the larger project, various groups of respondents, including farmers, experts, managers, and AEIs, were involved in data collection. The findings of this study will be used to formulate conclusions for the development of the competency profile. An important issue in this is the consideration regarding the specificity needed in differentiated competency profiles. For this, the role of farmers' courses provided by AEIs will be evaluated. The extent to which farmers are satisfied with these courses and also their opinion on actual and desired competencies of AEIs will be reviewed. Furthermore, farmers' course needs are studied. So the main purpose of the current study is to explore farmers' views about agricultural extension courses, motives for attendance, and competencies of agricultural extension instructors to find essential ingredients for the competency profile for AEIs.

The specific research questions of this study are the following:

1) What are the motives for farmers to attend agricultural extension courses?

2) To what extent do farmers appreciate the most recent course they attended?

3) What topics do farmers suggest for future courses?

4) To what extent do farmers evaluate the agricultural extension instructors (AEIs) as being competent?

5) What competencies do farmers think an AEI should posses?

6) What are the relationships between farmers' personal and farm characteristics (age, gender, education, land size etc.), course attendance motives, course satisfaction and the perceived competencies possessed and needed by AEIs?

5.3 Methods and data sources

As already stated, the research methods here are the same as those in the previous chapter and are therefore not repeated here. Only the structure of the questionnaire, which is different, is described here. The structure and content of the questionnaire is as follows (number of questions for each topic is mentioned between brackets): demographic characteristics of respondents (8); products produced on the farm (7); reasons for participating in courses

presented in the village by the agricultural extension services (AES)[4] (11); extent to which extension courses were relevant for real problems and difficulties on the farm (1); benefits gained from participation in the most recent course (3); characteristics of the last extension course taken (11); topics for future courses (1); actual competencies of AEIs involved (16); desired competencies of AEIs (1 open question).

5.4 Results

The results of this study will be presented in the order of the research questions. That means that first of all the motives of farmers for course attendance will be addressed. Next, the alignment of the courses to the needs of farmers will be presented. After that, topics for future courses will be reviewed. Subsequently, the results regarding the farmers' evaluations of AEIs will be addressed. And after that, the competencies farmers find important for AEIs will be presented. Finally, the relationships between farmers' personal and farm characteristics, course attendance motives, course satisfaction and the competencies possessed and required by AEIs will be analyzed. This will lead to the conclusion section in which the essential question of this study is answered, which is to what extent the whole project can result in a general comprehensive competency model, or to what extent target group differentiation is needed in the model. The demographic profile of farmers outlined in chapter 3 still holds and is therefore not repeated here.

5.4.1 Motives

The four most important motives reported on a 5-point Likert scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) were: acquiring new knowledge (M= 3.5; sd= .74), acquiring skills and experience (M= 3.4; sd= .82), personal interest (M= 3.1; sd= .85), and becoming more familiar with other farmers and extension employees (M= 2.9; sd= .78). On the contrary, the least important reasons were (ranks= 9, 10 and 11) getting a certificate at the end of the course (M= 1.0; sd= 1.26), spending free time, and being amused (M=0.6; sd= 1.10), and the insistence of friends (M= 0.4; sd= .98).

In other words, results show that the main motives for farmer participation are knowledge and skill acquisition, personal interest and socializing, whereas other incentives, such as receiving a certificate or spending free time are not crucial.

5.4.2 Alignment of courses and evaluation of the most recent course characteristics

As to the alignment of courses, farmers were asked to what extent they addressed their real problems, whether delivering extension courses were helpful at all. The average perceived alignment of the courses (235 courses up to the time of the interviews) to the real problems on a 5-point scale (0= not at all; 1= a little; 2= moderately; 3= very; 4= very much) was 3.15 (sd= .82). This means that farmers on the whole were very satisfied with this alignment. Furthermore, more than 95% of the farmers perceived the courses to be 'good' and 'excellent' in terms of the quality of implementation. Here the average (M) on a 4-point scale (1=weak; 2= moderate; 3= good; 4= excellent) was 3.6 (sd= 6.27). These findings are similar to what has been found in previous studies (e.g. Dashti, 1994; Keshavarz, 1994; Arabzadeh, 1997; Zamani & Talebianpour, 2001; Karbasioun & Chizari, 2004a; 2005; Karbasioun, Mirzaei & Mulder, 2005; Karbasioun & Mulder, 2005). For this course evaluation, 11 items were considered and the items were rated on a 5-point Likert-scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much). The results showed that, in general, farmers had a rather positive opinion about courses; they rated the items predominantly as 'moderate' and 'good' ($3.2 \geq M \geq 1.7$; $1.48 \geq sd \geq .58$). The farmers were satisfied with the timing of the courses (M= 3.2; sd= .70), applicability and feasibility of the content of the courses (M= 3.2; sd= .61), contact with staff members of the courses (M= 3.1; sd= .63), location of the courses (M= 3.0; sd= .64), and quality of catering and hospitality during the courses (M= 3.0; sd= .58). Aspects of the courses that could be improved were: examination methods (M= 1.7; sd= 1.48), and instructional technology and use of audio-visual instruments during the course (M= 2.0; sd= 1.15). According to these results, the farmers surveyed found that the courses were helpful but needed to be re-designed on some aspects such as the examination methods and the use of instructional technology (see also Karbasioun, Mulder & Biemans, 2007a; 2007b). There is, however, room for improvement regarding the strategies used for registering participants (Item 8: M= 2.6; sd= .74) and the length of the courses (Item 9: M= 2.6; sd= .94).

5.4.3 Topics for future courses

Farmers were asked to mention topics for courses they would like to be given in the future. This question was designed to uncover the specialization of AEIs that are needed in extension

courses. For this, an open-ended question was included in the questionnaire and asked during the interviews. After that, the answers were coded and categorized into different groups. According to the results, the topic that was wanted by the majority of the farmers first is crop products; 56% of the respondents mentioned this. Next, 43% mentioned using different inputs on the farm, 34% mentioned orchards, 34% vegetables, and 29% animal production.

Other topics for courses were in significantly lower demand according to respondents. Irrigation methods (7%), healthy production of milk (3%) and packing of agricultural and animal products (1%) were mentioned by only a few farmers. All topics mentioned were already presented by the MAJ but with different frequencies. The preferences mentioned by the farmers have implications for the disciplinary background of the trainers required and the AEI competence profile.

5.4.4 Competencies of AEIs as experienced by farmers

The competencies of AEIs as experienced by the farmers, who took part in the courses, were also assessed. According to the results, most of the competencies were rated as 'good' to 'moderately good' ($2.3 \geq M \geq 3.3$; 0=very weak; 4=very good). It can be concluded that according to the respondents the AEIs had a rather adequate level of practical and technical knowledge and skills to teach a training course.

The AEIs were capable of communicating the ideas in a comprehensible manner and listening to queries presented by the trainees. They seemed sufficiently experienced in the subjects they taught, class management, and communication skills (Ranks 1 to 3: $3.3 \geq M \geq 3.1$; $.79 \geq sd \geq .57$). However, the farmers expressed the least satisfaction with the evaluation skills (Rank= 7: M= 2.6; sd= .86), post-course follow-up (Rank 8: M= 2.4; sd= 1.01), and the use of appropriate instructional methods during the courses (Rank 9: M= 2.3; sd= 1.19).

Therefore, in the experience of these farmers, the AEIs were adequate, but there is room for competence development in a number of areas such as ways to encourage and stimulate farmers, examination methods, post-course follow-up and instructional technology skills.

5.4.5 Competencies of AEIs that farmers want

In addition to the previous question, farmers were asked to formulate the competencies of an AEI via an open-ended question. The results were coded and categorized. The intention of using an open question here was to give farmers the opportunity to formulate their opinions freely. The results are that 42% of the farmers thought that competent AEIs should have current knowledge and up-to-date information, and also 42% believed AEIs should have experience in the field of the course. A smaller percentage indicated that AEIs should use principles of supporting adult learners (27%), be competent in applying teaching methods (23%), be familiar with farmers' culture and language (20%), and finally, be aware of farmers' actual problems (23%). The items are indicators of the farmers' impressions about competencies of the AEIs in general; therefore, the categories are not comparable with those discussed in the previous part and were more specific.

5.4.6 Is a generic competency model for AEIs possible?

The final research question in this study is what are the relationships between farmers' personal characteristics, course attendance motives, course satisfaction, and the competencies possessed and needed by AEIs? This question is important to evaluate the possibility of creating one general competency profile of AEIs.

First of all, the relationship between personal characteristics and course attendance motives was studied. To explore the correlations between motives and to categorize them, an exploratory factor analysis was conducted for the data presented in table 5.1. The factor analysis used was a principal components analysis with factor extraction and VARIMAX rotation. This was done to examine the uni-dimensionality/convergence and discriminatory validity. The four commonly used decision rules were applied to identify the factors (Hair et al., 2005): 1. minimum eigen value of 1; 2. minimum factor loading of 0.5 for each indicator item; 3. simplicity of factor structure; and 4. exclusion of single item factors. Reliability was evaluated by assessing the internal consistency of the indicator items of each construct by using Cronbach's alpha. The motives for course attendance are categorised into three main components, which have been named *Personal Development*, *Performance Improvement*, and *Extrinsic Motives* (Table 5.1). Personal development and performance improvement together can be seen as intrinsic motives for course attendance. As mentioned before, the items that had

a correlation of higher than 0.5 were loaded in one component. Personal development motives could be defined as farmers' personal interest in taking part in the courses. Performance improvement motives are identified as information and skill-seeking behaviour of farmers. And finally, extrinsic motives can be described as motives that are not directly related to the course content and objectives, but to influences from outside, such as encouragements to participate in the courses by friends (see for details Table 5.1).

Table 5.1 Rotated component matrix for the motives of course attendance[1]

Motives	Component		
	Personal development	Performance improvement	Extrinsic motives
1. Acquiring new information		.88	
2. Acquiring new skills and experiences		.87	
3. Personal interest	.59		
4. Becoming more sociable with other farmers and extension employees		.70	
5. As a matter of curiosity	.62		
6. Extension agent request			.64
7. Due to a good feeling of readiness and youthfulness via attendance at courses	.84		
8. To get access to more facilities and services provided by extension centre after the course			.85
9. For getting a certificate at the end of course	.78		
10. For filling free time and being amused			.71
11. Friends insisting			.68

Note: Extraction method: principal component analysis. rotation method: varimax with Kaiser normalization. [1]: Rotation converged in 5 iterations.

The relationships between personal characteristics of farmers and the three mentioned motivation categories were measured using Pearson correlation test (r_p) for interval variables (age), Kendall's tau test (Kt) for ordinal variables (education level and categorized irrigated land size) and Mann- Whitney U Test for nominal variables (Gender and marital status). The significant results of these tests are presented in table 5.2.

Table 5.2 Relationships between personal and farm characteristics of farmers and course attendance motivation categories

Personal characteristics	Motivation Category	r_p^1 (n)	Kt^2 (n)	MW^3 (n, z)
Age	Personal development	-.483** (96)		
	Performance improvement	-.212* (97)		
	Extrinsic motives	-.260* (97)		
Education level	Personal development		-.156* (96)	
Size of irrigated land	Extrinsic motives		-.183* (91)	
Gender	Personal development			309.00** (95, -3.23)
	Performance improvement			400.50** (97, -2.72)
	Extrinsic motives			327.00** (96, -3.11)
Marital status	Personal development			251.00** (96, -3.10)
	Extrinsic motives			236.50** (97, -3.32)

Note: r_p^1= Pearson correlation test; Kt^2= Kendall's tau Correlation test;
MW^3 = Mann- Whitney U Test; * = Correlation is significant at the 0.05;
**= Correlation is significant at the 0.01

The data show that there was a significant negative correlation between age, personal development, performance improvement, and extrinsic motives. Older farmers were less motivated for courses. But this particularly holds for personal development motives (r_p=.483, N= 96). Education level is only negatively related to personal development related motives (Kt= -.156, N= 96), which means that higher educated farmers had less personal development motives for taking part in courses.

Differences between motives for the characteristics gender and marital status were tested with a Mann-Whitney-U test. The differences were significant for the following relationships: gender and personal development (MW= 309.0; Z= -3.23; Sig. = .001), performance improvement (MW= 400.5; Z= -2.72; Sig. = .007), and extrinsic motives (MW= 327.0; Z= -

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3.11; Sig. = .002), as well as marital status and personal development (MW= 251.0l; Z= -3.10; Sig. = .002) and extrinsic motives (MW= 236.5; Z= -3.32; Sig. = .001).

Furthermore, there was a significant negative relation between the size of the irrigated land a farmer owns and extrinsic motives (Kt = -.183*; Sig. = .010; N=91).

No significant correlations were found between the kind of farmers' land ownership (personal, rental, or mixed) and any of the three motive categories.

Also there was a significant positive correlation between extrinsic and personal development motives (Kt = .238**; Sig. = .000; N=96).

Next, the relationships between personal and field characteristics of farmers and course/AEIs characteristics were tested. Farmers' general satisfaction with the courses/AEIs was divided on two main levels, low and high, and a T-test was done for age, and a Mann Whitney test for ordinal variables such as education level and land size. The results of the T-test showed that there was no significant difference between age and satisfaction with AEIs, but there was a significant difference between age and satisfaction with courses (t = 2.892; df = 12; Sig. = .003). The Mann Whitney test (MW) showed no significant difference between farmers' education level, kind of ownership, irrigated land and dry-land size on the one hand, and their satisfaction with both courses and AEIs on the other hand. Finally a significant relationship was found between farmers' satisfaction with the courses and their satisfaction with AEIs (Kt = .211**; Sig. = .004; N=102).

5.5 Conclusions and discussion

As said before, many attempts have been made to construct competency profiles of agricultural extension employees. The most recent attempt is that of Shim (2006). These competency profiles are all broad, in the sense that they apply to various roles of the extension expert. The general project of which this study is part is aimed at defining a competency profile of agricultural instructors, which is basically one role of the extension expert.

Coming back to the main purpose of this study, which was to analyze the extent to which one general competency profile of agricultural extension instructors would be possible, we come to the following conclusion. Given the data in this study, we think such a general competency profile is possible, but variation is needed as to the gender, marital status, learning motives, age, and education level of farmers. These results support other related studies done by the

researcher et al. recently (Karbasioun, Mulder & Biemans 2007a; 2007b). Target group stratification and internal differentiation in courses should be included in the competency profile, because various relationships and differences were found in this study regarding course characteristics and competencies of instructors. For example, instruction (or more generally: learner support) can be differentiated by motives for course attendance such as leisure activity, acquiring new knowledge and skills, and actual performance improvement. Also, these motive categories might be used during the selection process of farmer-trainees, since these motives differ significantly.

Satisfaction with courses is rather high in general, but there is room for improvement. AEIs should be aware of that, and this should be taken up in the competency profile too. The competency would then read like: the AEI is sensitive to areas for course improvement, is able to identify those areas, and is able to realize those improvements.

Various topics for future courses were identified by the farmers; their preferences were very clear. This has important consequences for the selection or professional development of extension instructors as well. If disciplines vary too much (like crop science and animal science), it seems hard to include these in the competency profile. But a general element in the competency profile should be aimed at the match between the field of the course and the discipline of the instructor. There are, of course, overlapping areas, and interdisciplinary topics (like using inputs), and these should also be addressed in the competency profile.

The instructors (AEIs) have been evaluated quite positively by the farmers, although about half of their competencies are rated below the middle of the scale, so there is room for professional development on these competencies. However, if we take into account that much of the personal evaluations may be contaminated by social desirability and deduct one point off the scores, all competencies would be rated as moderate or lower. Of course, this is not fully justified, because the level of social desirability is not known, but the general idea gives a certain perspective to the data.

Now that this study is done, it is a lost opportunity that the competencies with which the AEIs were evaluated were not used for the identification of the relevance of these competencies for the competency profile. The competencies used for evaluating the AEIs could be inserted in the competency profile as they are, but this is too easy, because they should be weighted from different perspectives, and not from the farmers' perspectives alone. However, it can be

concluded that the most relevant competencies identified by farmers match the farmers' views on the actual competencies of the AEIs. Again, if the perceived competencies of AEIs were corrected for social desirability, there would be many professional development needs.

Looking back on the study we would suggest including a stronger performance focus next time. Farmers' perceptions and preferences are important, but what is also interesting is to what extent courses have actually impacted on factors such as the farm, farming, product quality, market share, poverty reduction, and sustainable development. Needless to say, that this requires another study.

The farmers in this study found that AEIs were adequately qualified, but they needed development in some aspects such as motivational skills, implementing examination methods, following up lessons, and using instructional technology. These findings are in line with previous studies (e.g. Chizari & Karbasioun, 1998; Karbasioun & Mulder, 2004b). Farmers expect AEIs to be more sensitive towards the real problems they face and to tailor the course content accordingly. Simple participation in these short-term courses is not enough to enable them to apply the knowledge gained. As such, they expect AEIs to provide a more practical teaching approach that includes a proper follow-up and evaluation.

As to the competencies of AEIs, respondents believe that a competent AEI should be well-informed (having up-to-date knowledge), be experienced, be able to apply the most relevant and up-to-date teaching methods, be familiar with farming culture and language and, finally, be aware of the problems farmers actually face. The competencies found in this study, and those found in the other studies of this project, will be taken together, and compared with the more general competency profiles of extension experts, such as the one developed and evaluated by Shim (op cit). The researchers hope to be able to report on this in the final chapter of this thesis.

Concluding remarks of part I

Looking at chapter two of Part I, it is evident that non-participant farmers have experienced significantly more difficulties to cope with changes in comparison to participant farmers. They were more concerned about their situation and had less hope of receiving supports from AES/AEIs in comparison with participant farmers. Chapter three demonstrated that even participant farmers do not have access to a wide range of information sources and coping strategies. However, their most important information source is governmental AES. As a whole, the evolution of the changes they underwent (internal and external) are positive but at a very slow rate. Chapter four disclosed the fact that although AES has supported farmers to a certain extent, it is not sufficient yet. There is still a big gap between present support of AES and the expectations of farmers. A surprising finding of this chapter was that many extension projects are even unknown to farmers. Finally, chapter five expressed that extension courses have played a notable role in the development of farmers but there is room for improvement. Farmers are moderately pleased with AEIs; nevertheless, they think that AEIs should improve their competencies in some aspects such as instructional technology, follow up skills, and examination skills. Generally speaking, part I of the thesis gives the idea that present knowledge and skills of farmers are not adequate. They need more financial and training support in order to overcome the challenges ahead. AEIs are in a powerful position in this respect and can be of notable help to farmers if they themselves are competent.

Part II:
Studies of experts

Overview

Part II of the dissertation encompasses the two studies of experts (chapters six and seven). Agricultural experts, managers, technical specialists and AEIs comprised the respondent group for these two chapters. In total, 130 individuals were selected for the studies of experts. Because the demographic profile of the respondents and also research methodology are similar in both chapters, they are both only presented once in chapter six. These studies are aimed at investigating the viewpoints of experts about the evolution of agricultural development (AD) and agricultural extension services (AES), their major problems at present and in the future. In general, the idea behind the studies of experts is that experienced and knowledgeable experts can give trustworthy information about the context of AD/AES, the crucial problems, the priority of addressing the problems in the future by the ministry of agriculture (MAJ) and organizations involved in training of farmers. Finally, the differences between the views of various groups of experts in relation to AD and AES and the problems involved are investigated in this part. This information is taken into account in developing the competency profile for AEIs in the synthesis part of the dissertation (Part III). As can be seen, the findings again have implications for the future forces, ethical issues and competencies needed for AEIs in the future. Hence, the outcomes of this part will be carefully used in developing the competency profile for AEIs in the synthesis section (Part III).

Chapter six

Changes in Agricultural Development –

A Survey of Views of Experts[♣]

6.1 Introduction

Agriculture is the bedrock of development and core of the export market and it is accountable for one-fourth to one-half of (GDP) gross domestic product in developing countries. Dependence on agriculture is remarkably higher for more than half of the Asian countries. The Ministries of Agriculture of these countries have taken the lead in planning, financing and implementing strategies for Agricultural Development (AD).

This trend continues in all countries; although private sector participation in agriculture has increased in the last two decades (Boserup, 1993; Sulaiman & Hall, 2004). Generally speaking, three different periods can be identified for AD. These are the pre-industrial intensification period, the industrial period and finally the science-based period, in which the rate of output has increased from one to over four percent per year (Boserup, 1993). Meanwhile, many AD models have emerged and been used by various countries so far. They have mainly focused on the technology transfer and green revolution, which started in Mexico in the mid-1940s and was then applied by developing countries in the late 1960s.

In some countries, such as Japan, AD was proceeded by the industrial revolution in the 19th century. In the US and a noticeable number of western countries, AD was boosted during the post-war period with dramatic yield and productivity increases and from that time AD became an increasingly global process. However, AD, like industrialization, systematically drew from western countries; although some eastern characteristics of AD such as small and family farming did not change (Djurfeldt & Jirstrom, 2002; Palladino, 1987;). More recently a new tendency in AD has been growing, which is using "*sustainability*" as a criterion for agricultural changes. Sustainability has increasingly been considered by many countries as a means of increasing production and simultaneously being environmentally and natural resource friendly (Fujisaka, 1994; Hansen, 1995; Keulen et al., 1998).

Another dominant AD philosophy that is attracting the attention of researchers and policy makers is the "*systematic approach*" which aims at the development of new strategies of thinking, knowing and learning in the area of AD. In this view, the systematic approach must be translated into presenting innovative curricula, research methodologies and extension

strategies (Bawden, 1992; Fleming & Hardaker, 1993; Holt, 1986; Kropff et al., 2001; Smith, 1992).

In sum, various worldwide AD models and strategies have focused on the following dimensions: Improving the productivity and sustainability in agriculture, rural poverty reduction, developing bio-diversity; retaining and protecting water resources in a sustainable manner, preserving, rehabilitating and renewing forests and reducing land degradation (Consultative Group on International Agricultural Research, CGIAR, 2002). In spite of the progress already made in agricultural research, the gap between AD models and professional practices has steadily increased and repeatedly been a challenging issue for different researchers and practitioners in this field. AD is consequently a complicated concept and not easily achieved by the majority of countries (Prevost, 1996).

In Iran, like other developing countries, agriculture is one of the most important economic sectors and comprises a considerably high percentage of production and employment. About 25% of the Gross National Product (GNP), 33% of employment, 25% of non-oil exports, and 80% of food requirements have been provided by the agricultural sector in Iran (The Canadian Trade Commissioner Service: Country profile of Iran, 2001; United Nations, 2003).

Nevertheless, there is various evidence that agriculture still lags far behind its real potential in Iran considering the country's available resources and in addition, sustainable land use has not yet been achieved. For instance, about 30% of the forests located in the North of Iran were destroyed during the last two decades. Furthermore, large portions of pastures and grasslands were rendered unproductive because of overuse by the cattle of the nomadic population and farmers (Darvishi, 2003).

Karshenas (1994) contends that a great number of AD problems originate from deficits in HRM and not from shortages of natural resources. Foltz (2002) also claimed that mismanagement is the major reason for the water crises that occurred in the previous years in Iran although he believed that they were partly drought-related. He documented his claim with a quote from Iran's Deputy Energy Minister, Rasul Zargar, when he said "…up to 37% of Iran's drinking water is lost because of outdated, leaking distribution systems…" (Tehran Times, 15 July 2001, p.4).

Similarly, 60% of the 82 billion cubic meters of water used in the agricultural sector fails to reach crops. Many academics also support the idea of a faulty irrigation system in Iran in their studies (see Afkhami, 1998; Karami & Rezaei-Moghaddam, 2005; Khatoonabadi, 1999; McLachlan, 1988).

Kalantari (1995) pointed out the most important problems hindering productivity increase in the agricultural sector of Iran and listed them as follows: the small size of agricultural lands and production scales, the restrictive macro policies in the agricultural sector, financial difficulties of the majority of farmers, the need for greater funds, insufficient investment in infrastructure, low quality of products and insufficient technical skills of farmers, and the inefficiency of governmental supports in promoting agricultural extension schemes.

As illustrated by a qualitative comparative case study (Karami & Rezaei-Moghaddam, 1998), socio- economic characteristics and environmental conditions of the farm have lead to the relative impoverishment of Iranian farmers. Smallholder farmers in unfavourable socio-economic and environmental conditions are relatively poorer. Their findings also illustrated that poverty is a major cause of unsustainable agriculture. Poor farmers' insufficient management competencies lead to higher soil erosion, over-fertilisation, inadequate application of manure, lack of fallow, overgrazing, burning of crop residue, and over-use of pesticides.

Therefore, it is evident that AD in Iran needs to be facilitated in order to address farmers' demands. As a result of these inadequacies farmers are not appropriately informed, skilled and competent to do their jobs efficiently.It must be said that although rural areas are the most important regions for agriculture in Iran, unfortunately, little attention has been paid to these productive areas and, consequently, to rural farmers by policy makers. Barichello (2004, p. 2) also reported this fact when he said:

> "…for most developing countries, the bulk of their poverty is found in rural areas, which raises questions about the structure of these economies, specifically the relative size and importance of the agricultural sector…"

Moreover, Ashley and Maxwell (2001) stressed that this phenomenon is not just a matter of developing countries but it is a worldwide problem. Many other scientists support this belief too (see Johnson, 2000; Lanjouw & Lanjouw, 2001; Rosenzweig, 2003).

In Iran, rural economic activities are based on three focal sectors (agriculture, industry and services). In total, about 50% of active rural people are working in the agricultural sector, 27% in industry and 23% in the service sector. The total cultivated land area is about 18 million hectares, while the total number of rural livestock amounts to 92 million (The Canadian Trade Commissioner Service: Country profile of Iran, 2001).

All these phenomena confirm the crucial situation of villagers in the context of AD and the necessity of supporting them to be more productive and achieve a better outcome. Similarly, a recent study (Bageri & Shahbazi, 2003) discovered that many Iranian farmers lack technical competencies at many stages of farming activity such as planting, harvesting, plant protection and using agricultural machinery. The study showed that 75-82% of young farmers should be taught about all previously mentioned aspects of farming.

More recently Karbasioun & Mulder (2004a; 2005; 2007b; 2007c) underlined the vital role of rural development in realizing AD and disclosed that farmers in the province of Esfahan in Iran had difficulties in coping with the negative changes and problems they experienced. Although governmental agricultural extension services (AES) helped them to some extent, nonetheless, they had to overcome the changes by relying on their own initiative, relatives and friends. Other studies of Karbasioun et al. (see Chizari, Karbasioun & Linder, 1998; Karbasioun, Chizari, 2004b; 2005; Karbasioun, Mirzaei & Mulder, 2005) also support this fact.

As already stated, AD in Iran has been hindered by many problems over the last decades and consequently policy makers have tried to address these difficulties by implementing several sets of national five year agricultural plans. These problems originate from a wide variety of sources as well as physical and humanistic issues. Few studies have been carried out on this topic and only a minority have a long-range perspective with the aim of anticipating the priorities for the future of AD in order to develop the competencies of HR professionals in the field.

Therefore, this study was carried out as part of a bigger project for developing a competency profile of agricultural extension instructors (AEIs). Hence, as a context study of the bigger project, this study is intended to explore the evolution of AD during the last decade as seen from the perspective of agricultural experts.

The AD problems that will be crucial in the next 3-5 years are also addressed. Furthermore, the study aims at examining the shortcomings and strengths of previous national plans for AD. The extent to which the Ministry of Agriculture (MAJ) has been able to, and could be able to, address these problems in the future is explored too. Finally, implications of the findings for developing the competency profile of AEIs will be discussed.

6.2 Purpose and research questions

In this study the general purpose is to investigate the perceptions of agricultural experts of the evolution of AD and its problems from the last decade up to the present-day in Iran in order to develop a competency profile for AEIs. To achieve this general purpose, the specific research questions are formulated as follows:

1. *What AD changes have been perceived by the expert, in Iran over the last decade? Are they regarded as positive or negative, and to what extent?*
2. *What have been the most important AD problems in Iran over the last decade? Which ones will remain important for the next five years? What is the priority of considering these problems in the next five years?*
3. *To what extent has the MAJ addressed AD problems so far and is MAJ able to solve the problems on its own.*
4. *What are the relationships between experts' personal traits and the AD changes and problems?*
5. *What are the implications of the findings of this study for the competency profile of AEIs?*

6.3 Methods and data sources

In this study, interviews along with survey questionnaires were used for data collection. To pilot test the survey questionnaire, fifteen interviews were carried out with selected agricultural experts and managers in the Agricultural-Jihad organization of the province of Esfahan.
This selected small group of experts were comparable with the major target group. Each interview took about one hour in which enough time was given to the interviewees to explain

whatever they felt was most important to discuss. The selected experts were excluded from the main study at the end. A semi-structured questionnaire was used for interviews.

The interview process lasted two weeks in total from 15th until 30th of March 2005. At this stage, the validity of the questionnaire was tested and some questions were changed, added or deleted where necessary. Thereafter, the questionnaire was distributed among three of the teaching staff of Wageningen University and also a translated version of the questionnaire was posted to 22 experts, managers and instructors in the MAJ and the Ministry of higher education of Iran. All professors and 12 experts replied and gave their general or detailed remarks on the questionnaire. This process helped to assure the reliability of the questionnaire. At the end, the translated questionnaire in Farsi (Iranian language) was revised by taking the views of 17 Iranian agricultural PhD students and experts who were studying in Wageningen University into account. In the next phase, 130 agricultural experts who were skilled and sufficiently knowledgeable in the field of Agricultural extension and development in Iran were selected out of the whole population (212 persons) of agricultural experts in the agricultural-Jihad organization of the province of Esfahan. Therefore, the research covered nearly 60% of all respondents.

The selection method was accomplished to ensure that experts are truly informed and experienced. To do so, a pre-inquiry was carried out and those experts who had at least five years of work experience, or had research or publications about agricultural extension and related fields, were picked out of all available respondents (130 individuals).

The questionnaire, including open and closed questions, was prepared and used for data collection. In designing the closed questions, a 5-point Likert-type scale was applied. Then the questionnaires were sent to the target group addresses in different townships of the province of Esfahan. A total of 83 questionnaires were returned and a total of 70 ($\cong$54% of 130 selected experts) completed questionnaires were used in the study. Then, the data were analyzed using SPSS software.

A quantitative method of data analysis was applied. Descriptive statistical analyses were used to determine AD changes and problems. Furthermore, non-parametric statistical methods such as Pierson and Kendal tau Rank Correlation Coefficients and Cruskal Wallis tests were used. Where allowed, F–tests were also carried out to explore the possible significant differences

between personal characteristics of respondents and their views about the abovementioned variables.

The final questionnaire consisted of several categories of questions. The topics of the questionnaire are the following (number of questions for each topic is mentioned between brackets):

1. Background information of experts (such as age, gender, level of education, present position in the organization, work experience, level of expertise and experience (12);
2. Experts' level of expertise and experience in different AD related fields (10);
3. The rate of frequent and interactive contact with farmers (1);
4. The extent to which different aspects of agriculture (selected from the latest National AD Plan) have improved or unimproved during the last decade (28);
5. AD problems in Iran at the present time and in the next five years (105).

6.4 Results

First of all the results of the study about respondents' characteristics are presented below.

6.4.1 Experts' demographic profile

Table 6.1 indicates the personal characteristics of the sample of experts in this research. About 50% of experts were educated to masters degree level; the vast majority of them were male (94%) and 45% were between 41 and 50 years of age.

Nearly half of the experts in this study had more than 20 years of work experience. Additionally, the minority of them (22.7%) had high rank managerial positions and 44% were technical specialists without any managerial position.

Table 6.1 Experts' demographic profile (Part 1)

Variables	Freq	Perc	Cum Perc
Level of education			
Associate	8	11.8	11.8
Bachelor	27	39.7	51.5
Master of science	32	47.1	98.5
Doctorate	1	1.5	100.0
Total respondents	68	97.1	
Gender			
Male	63	94.0	94.0
Female	4	6.0	100.0
Total respondents	67	95.7	
Age (years)			
30 or less	1	1.7	1.7
31-40	22	37.9	39.7
41-50	26	44.8	84.5
51 or more	9	15.5	100.0
Total respondents	58	82.9	
Work experience (Years)			
5 or less	2	3.3	3.3
6-10	12	20.0	23.3
11-15	11	18.3	41.7
16-20	6	10	51.7
21 or more	29	48.3	100.0
Total respondents	60	85.7	
Organizational position			
Manager rank 1	15	22.7	22.7
Manager rank 2	22	33.3	56.0
No managerial position	29	44.0	100.0
Total respondents	70	100.0	

The subject-specialties of respondents were distributed among 22 different majors. Of respondents, 13.6% had a degree in agronomy and 12.2% were animal husbandry specialists, 9.1% were extension professionals, 9.1% sociologists, and 6.1% had a general management degree.

These specialities altogether covered half of the sample and the remaining respondents had 17 other different specialities. About 40% of experts were the employees of extension and rural services departments and around 30% of them were employees of the directorate office.

The remaining numbers of respondents (30%) were distributed among nine other organizations where agricultural research centres (9%) and universities (7.5%) were the most popular group. With respect to experts' townships in the province of Esfahan, 65.5% of experts were the employees of Esfahan Township (the centre of the province of Esfahan) and others were employees of 12 different townships across the province.

Table 6.2 Experts' demographic profile (Part 2)

Variables	*Freq*	*Perc*	*Cum Perc*
Educational major			
1. Agronomy	9	13.6	13.6
2. Animal husbandry	8	12.2	25.8
3. Agricultural Extension	6	9.1	34.9
4. Sociology	6	9.1	44.0
5. General Management	4	6.1	50.1
6. Plant protection	4	6.1	56.2
7. Rural development	4	6.1	62.3
8. Others (15 different disciplines)	25	37.7	100.0
Total respondents	66	94.3	
Organizational department			
1. Extension and rural services	27	40.3	40.3
2. Administrative chair (dean's) office	20	29.9	70.2
3. Agricultural research centre	6	9.0	79.2
4. University	5	7.5	86.7
5. Others (7 different organizations)	9	13.3	100.0
Total respondents	67	95.7	
Township			
1. Esfahan	36	65.5	65.5
2. Naein	3	5.4	70.9
3. Borkhar-va-Meime	3	5.4	76.3
4. Ten other townships	13	23.7	100.0
Total respondents	55	78.6	

Self-assessment questions were asked to the respondents to uncover the experts' perceptions of their level of knowledge of ten different AD related disciplines (table 6.3). The mean scores of experts for these knowledge domains were between 2.6 (sd= .77) and 3.4 (sd= 1.09) where the majority got scores equal to or higher than 3.0 (=moderate).

The scale used ranges from 1 (=very little) to 5 (=very much). Therefore, all experts perceived themselves to be moderately or considerably knowledgeable in different AD related disciplines. They particularly assumed themselves to be knowledgeable in rural training, agricultural extension and education, and agriculture work ($3.4 \geq M \geq 3.3$; $1.09 \geq sd \geq .88$).

Table 6.3 Distribution of experts' knowledge in different scientific AD related areas
(Total respondents: 70)

Subject	r[1]	M[1]	SD
Rural training	1	3.4	1.09
Agricultural extension and education	1	3.4	.88
Agriculture work	2	3.3	1.00
Administrative management in agriculture	3	3.2	.99
Rural sociology	3	3.2	.93
Agricultural development	4	3.0	.74
Agricultural innovations	4	3.0	.79
Agricultural research	4	3.0	.96
Agricultural policy making	5	2.7	.95
Agricultural economy	6	2.6	.77

Note: [1]Rank [2]Mean: 0= nothing; 1= very little; 2= little; 3= moderate; 4= much; 5= very much

In reference to the frequency of respondents' contact with farmers, 63.2% of experts in total claimed that they have often or always direct contact with farmers and 26.5 % mentioned that they occasionally have contact with farmers. Only 8.8% stated that they have rare or no contact with farmers (Table 6.4).

Table 6.4 Distribution of experts' views about their contact with farmers

Direct contacts with farmers	*Freq*	*Perc*	*Cum Perc*
Nothing	1	1.5	1.5
Rarely	5	7.3	8.8
Occasionally	18	26.5	35.3
Often	30	44.1	79.4
Always	13	19.1	98.5
No answer	1	1.5	100.0
Total respondents	68	100.0	

6.4.2. General perceptions of experts about the research questions

To have an overview of the experts' perceptions about AD changes, problems, their importance at present and in the future, the extent of addressing problems by the MAJ, and finally the solvability of the problems by the MAJ alone, all sub-questions in each category (10 questions for AD related knowledge of experts, 28 questions for AD changes, and 21 questions for AD problems) were summed up and one key variable was calculated for each category as is shown in table 6.5.

To assure the reliability of each category, Cronbach's alpha coefficient for all clusters was separately calculated which was higher than .81 in all cases (column 3 of table 6.5). Based on the first row of table 6.5, respondents perceived themselves to be moderately knowledgeable in AD related fields (M= 3.36, sd= .68).

The scale used for this category ranged from 1 (=very little) to 5 (=very much). Additionally, according to the second row of the table, it could be assumed that, on average for all AD changes, there is room for improvement (M= 3.39, sd= .32).

The 5-point scale for AD changes (1= Very decreased; 2= Decreased; 3= No difference; 4= Slightly increased; 5= Very increased) was considered. It means that in the view of respondents the evolution of AD during the last decade has not been convincing and needs to be

accelerated. Additionally, both current and future AD problems in the scale used (0= not important; 1= a little important; 2= moderately important; 3= very important; 4= very much important) were assumed as moderately to very important (M= 2.70, sd= .59; M= 2.85, sd= .58).

To examine the extent to which the MAJ has addressed those problems, a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) was applied. As it is seen, the perceived MAJ priorities (M= 2.83, sd= .84) are considerably higher than what the MAJ has already done in the past according to experts (M= 1.81, sd= .54). Finally, using a 2-point scale (0= No; 1= Yes), experts declared that the majority of experts believe that the problems cannot be resolved by the MAJ alone (M= .35, sd= .23).

Table 6.5 Experts' overall perceptions with respect to key variables
(Number of respondents= 70)

Subject	Q^1	α^2	Nu^3	M	SD
1. Experts' AD knowledge	10	.87	3	3.36	.68
2. Overall AD evolution	28	.81	3	3.39	.32
3. Importance of AD problems right now	21	.85	2	2.70	.59
4. Importance of AD problems in the next five years	21	.86	2	2.85	.58
5. The extent to which MAJ has addressed AD problems so far	21	.85	2	1.81	.54
6. Priority of addressing AD problems by MAJ during the next five years	21	.93	2	2.83	.64
7. Possibility of solving AD problems by MAJ alone	21	.88	.5	.35	.23

Note: [1]number of questions; [2]Cronbach's alpha; [3]Neutral value in the 5-point scale (for the first six rows of the table) and 2-point scale (for the last row of the table) used for the questionnaire

The following sections address research questions one to five.

6.4.3. Research question one: AD changes

With respect to the first research question, respondents perceived AD changes, in most cases, as positive but not convincing. The seven most developed issues according to the experts are listed in part A of table 6.6. Establishment of intensive farming and greenhouses, application of new irrigation methods (see also the research done by Pigram, 1977) and insurance funds allocated to agricultural products were mentioned as the three most developed aspects ($4.1 \geq M \geq 4.0$; $.82 \geq sd \geq .43$) on the 5-point scale (1= Very decreased ; 2= Slightly decreased; 3= No difference; 4= Slightly increased; 5= Very increased).

Items <u>1, 2 and 5</u> indicate that the agricultural sector has improved the application of new technologies (such as greenhouse and intensive farming, new irrigation methods and mechanisation technology). Items <u>3, 4 and 7</u> illustrate a moderate improvement in the MAJ's financial support for farmers (Insurance fund, stabilising the prices of agricultural products and long-term loans).

According to part B of table 6.6, experts perceived that AD has deteriorated in preventing the settlement of the industries or residential sites in agricultural areas and also in stabilising the price of agricultural inputs (M= 2.6, sd=1.20; M= 2.8, sd= 1.28).

No changes were perceived in sustainability in agriculture and natural resources (M= 3.0, sd= .89) and very little increase was mentioned in the balance between livestock numbers and rangelands, active participation and cooperation of villagers in agricultural policy making and transparency of supportive policies in agriculture and natural resources respectively (M= 3.2, $.96 \geq sd \geq .8$).

Overall, the items <u>3, 4 and 6</u> mentioned in part B of table 6.6 pinpoint the lack of sustainability in the farming system of Iran, as perceived by respondents. Likewise, items <u>1, 2 and 5</u> of part B, stress the shortage of supporting policies, usage of participatory approaches, and failure of the MAJ in stabilizing the prices of agricultural inputs ($3.2 \geq M \geq 2.8$; $1.28 \geq sd \geq .8$).

Table 6.6 Distribution of experts' views about AD changes in Iran during the last decade
(Total respondents: 70)

AD changes				
A. Most developed issues (highest scoring variables)	*r[1]*	*V[2]*	*M[3]*	*SD*
1. Establishment of intensive farming and greenhouses	1	+	4.1	.70
2. Application of new irrigation methods	1	+	4.1	.43
3. Insurance funds allocated to agricultural products	2	+	4.0	.82
4. Stabilising the prices of agricultural products by the Ministry of Agriculture	3	+	3.8	.72
5. Access of farmers to mechanisation technology	3	+	3.8	.58
6. The provision of training programs (to farmers and employees)	3	+	3.8	.72
7. Long-term loans allocated to small farmers	3	+	3.8	.77
B. Least developed issues (lowest scoring variables)	*r[1]*	*V[2]*	*M[3]*	*SD*
1. Transparency of supportive policies in agriculture and natural resources	9	+	3.2	.96
2. Active participation and cooperation of villagers in agricultural policy making	9	+	3.2	.80
3. Balance between livestock number and rangelands	9	+	3.2	1.0
4. Sustainability in agriculture and natural resources	10	0	3.0	.89
5. Stabilising the price of agricultural inputs by the Ministry of Agriculture	11	_	2.8	1.28
6. Preventing the settlement of the industries or residential sites in agricultural areas	12	_	2.6	1.20

Note: [1]Rank; [2]Value: (+) = positive ; (0) = neutral & (–) = negative   [3]Mean: 1= Very decreased; 2= Slightly decreased; 3= No difference; 4= Slightly increased; 5= Very increased

6.4.4. Research question two: AD problems

To address research question two, respondents were asked to rate 21 items based on their current importance, future importance and also the potential priority allocated to them by the MAJ in the next five years. The results are displayed in parts (A, B and C) of table 6.7. The scale used ranges from 0 to 4 (0= not important; 1= Important; 2= moderately important; 3= very important; 4= Extremely important).

 In part A of this table, the failure of the MAJ to control beneficiary mediators and dealers (being the sole beneficiaries of farmers' products) in the agricultural sector was assigned as the first crucial problem at present (M= 3.1, sd= 1.12). Lack of sufficient financial support by the MAJ was perceived as the second important problem (M=2.9, sd= .91) by respondents.

 The three other crucial problems were failure of the MAJ to attain international contacts in the global market (M= 2.9, sd= 1.21), untrustworthiness of the agricultural sector for investors (M= 2.8, sd= 1.05) and unfair influence of political issues on decision making in the agriculture sector (M= 2.8, sd= 1.15).

The most dominant problems in the next five years (part B) were mainly the same as the current problems (items 2, 3 & 4). There are also new concerns discernable for the future such as inadequacy of funds allocated to agricultural projects by the government (M= 3.3, sd= .90), which was assigned as the first priority and the shortage of competent employees in the MAJ (M= 2.9, sd= .96) as the fifth priority.

 Finally, in part C of table 6.7, the priority of addressing problems is listed. Experts deemed the first priority as the implementation of five year AD plans by the MAJ (M= 3.1, sd= .92). Then they once again highlighted the necessity of controlling dealers in the agricultural sector (M= 3.1, sd= 1.05), expanding the international contacts of MAJ (M= 3.0, sd= 1.07), allocating sufficient funds to agricultural projects (M= 3.0, sd= 1.04), and encouraging investors to invest in the agricultural sector (M= 3.0, sd=1.05).

Table 6.7 Distribution of experts' views about AD problems

AD problems				
A. Most important AD problems at present	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Lack of power of the MAJ to control various mediators and dealers in the agriculture sector	68	1	3.1	1.12
2. Inadequacy of financial support for farmers by the MAJ	68	2	2.9	.91
3. Failing to achieve international contacts and active participation of the MAJ in the agricultural global market	67	2	2.9	1.21
4. Untrustworthiness of the agricultural sector for private individuals and companies to invest in it	67	3	2.8	1.05
5. Influence of political issues on decision making for agriculture	66	3	2.8	1.15
B. Most important AD problems in the next five years	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Inadequacy of funds allocated to agricultural projects by the government	66	1	3.3	.90
2. Lack of power of the MAJ to control various mediators and dealers in the agriculture sector	65	2	3.2	.95
3. Failing in international contacts and active participation of the MAJ in agricultural global market	67	3	3.1	1.09
4. Influence of political issues on decision making for agriculture	65	4	3.0	1.03
5. Shortage of competent employees in the MAJ	69	5	2.9	.96
C. AD problems with greatest priority to be addressed in the next five years by the MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Implementation of five year national agricultural plans	66	1	3.1	.92
2. Controlling various mediators and dealers in the agriculture sector	66	1	3.1	1.05
3. International contacts and active participation of the MAJ in the agricultural global market	66	2	3.0	1.07
4. Allocating sufficient funds to agricultural projects	66	2	3.0	1.04
5. Encouraging private individuals and companies to invest in the agricultural sector	67	2	3.0	1.05

Note: [1]Number of respondents; [2]Rank; [3]Mean: 0= not important, 1= little important, 2= moderately important, 3= very important, 4= very much important

6.4.5. Research question 3: the extent to which MAJ addresses AD problems

On a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) experts perceived that the MAJ has, on average, addressed AD problems between 1.2 and 2 (a little to moderate extent). As shown in part A of table 6.8, they cited that five year national agricultural plans are moderately well designed (M= 2.1, sd= .97). In the second place, implementing training programs and providing new learning and communication technology for employees were assumed to be moderately addressed (M= 2.0, sd= .91 & 1.11).

In part B of table 6.8, it can be seen that in the experts' opinions the MAJ has attempted, to a very little extent, to improve the low level of farmers' education, and has not been adequately able to control various beneficiaries in the agriculture sector (M= 1.2, sd= 1.06; M= 1.2, sd= 1.13).

In addition, the MAJ has not paid sufficient attention to employees' motivations, undue political impacts on agricultural sector and employees' competency assessment (items 3, 2 & 1 of part B, $1.6 \geq M \geq 1.5$; $1.22 \geq sd \geq .98$).

In part C and D of table 6.8 the focus was on the rate of problem resolution by the MAJ alone. A broad average from 0.1 to 0.8 on a 2-point scale (0= No; 1= Yes) was obtained. 0.1 (0.8) means that 10% (80%) of respondents were in agreement with the claim that the problem is solvable by the MAJ. From the table it is perceivable that all five items that received the highest rate of solvability in part C are HRD-related problems (internally solvable) and are directly under the control of MAJ. In other words, themes such as competency assessment of employees and farmers' access to new information technology and arrangement of training programs for employees and farmers are all components of HRD programs. Oppositely, in part D of the table, the least solvable problems were dedicated to mainly external problems which are related to overarching governmental decision making policies such as controlling beneficiary dealers (M= 0.1, sd= .32), preparation of five year AD plans (M= 0.1, sd= .35), mistrust of the agricultural sector (M= 0.1, sd= .35), funds allocated to the MAJ (M= 0.1, sd= .36), and political issues (M= 0.2, sd= .38).

Table 6.8 Distribution of experts' views about the extent to which the MAJ has addressed AD problems and their solvability by the MAJ

Addressing AD problems by the MAJ				
A. AD problems moderately addressed by MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Designing appropriate five year AD plan by the policy makers	66	1	2.1	.97
2. Implementation of training programs to enhance the competency of employees	64	1	2.0	.91
3. Preparation of new learning and communication technology for employees	67	1	2.0	1.11
4. Providing financial support for farmers by the MAJ	64	2	1.9	1.00
5. Implementation of training programs for farmers and other careers involved in the agricultural sector	64	3	1.8	.89
B. AD problems addressed to the least extent by the MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Considering low level of farmers' education to be improved	61	8	1.2	1.06
2. Controlling various mediators and dealers in the agriculture sector	65	8	1.2	1.13
3. Increasing employees' motivation and accountability in the MAJ	65	6	1.5	1.10
4. Reducing the Influence of political issues on decision making for agriculture	57	5	1.6	1.22
5. Performing competency assessment of employees	65	5	1.6	.98
C. AD problems that are most likely solvable by the MAJ alone	**n[1]**	**r[2]**	**m[3]**	**SD**
1. Competency assessment of employees	65	1	.8	.40
2. Competency assessment of farmers	61	2	.7	.43
3. Access of employees to new learning and communication technology	63	2	.7	.44
4. Training programs to enhance the competency of employees	64	2	.7	.46
5. Training programs for those involved in agriculture	61	3	.6	.48
D. AD problems that are hardly solvable by the MAJ alone	**n[1]**	**r[2]**	**m[3]**	**SD**
1. Lack of power of MAJ to control and manage various mediators in the agriculture sector	61	7	.1	.32
2. Preparation of appropriate five year AD plan by the policy makers	65	7	.1	.35
3. Mistrust of the agricultural sector by private individuals and companies for investment	63	7	.1	.35
4. Funds allocated to agricultural plans by the government	65	7	.1	.36
5. Influence of political issues on decision making for agriculture	64	6	.2	.38

Note: [1]Number of respondents; [2]Rank; [3]Mean= Mean for addressing the problems:
0= nothing, 1= a little, 2= moderately, 3= very, 4= very much; [3]m = Mean for solvability of the problem by MAJ alone: 0= No & 1= Yes

6.4.6. Research question 4: Relationships between respondents' personal traits and AD changes and problems

To see whether there is any relationship between personal characteristics of experts and their opinion about AD changes and problems, Pierson and Kendal tau correlation, Kruscal Wallis and F-tests were used. The results are displayed in three different parts as follows:

6.4.6.1 Inter-relationships of expert's traits: older experts had lower educational degrees (r_p^-= - . 267*, sig. = 0.042, N= 58) and had more contact with other farmers (r_p^-= .304*, sig. = 0.024, N= 56). Experts with more work experience, had lower educational degrees (r_p^-= - . 277*, sig. = 0.032, N= 60) but more contact with farmers (r_p^-=. 287*, sig. = 0.029, N= 58). Furthermore, respondents who had more contact with farmers perceived themselves to be more knowledgeable in AD related fields (r_p^-=. 305**, sig. = 0.002, N= 67) and they had higher organizational positions (r_p^-=. 334**, sig. = 0.002, N= 64).

6.4.6.2 Relationships between experts' traits and the clustered AD issues (mentioned in table 6.5):

Significant positive relationships were found between the educational level of respondents and the necessity of addressing AD problems in the next five years (χ^2= 8.315*, df= 3, Sig. = .040) and the extent to which the MAJ has already addressed these problems (χ^2= 7.539*, df= 3, Sig. = .057). Additionally, a significant difference was explored between experts with different work experience and their perceptions about changes that have happened in AD up to the present (F= 1.847*, sig. = 0.050, df= 20). Finally experts who had more frequent contact with other farmers were more optimistic about AD changes (r_p^-=. 239*, sig. = 0.011, N= 68) and the role of the MAJ in addressing AD problems during the last decade (r_p^-=. 218*, sig. = 0.021, N= 68). They also gave higher priority to addressing AD problems in the future (r_p^-=. 250*, sig. = 0.040, N= 68).

6.4.6.3 Relationship between experts' traits and some important AD changes: work experience and educational level were the two personal characteristics of experts that were found to have significant correlations with some AD changes.

6.4.6.3.1 Work experience: positive significant relationships were found between experts' work experience on the one side and the following variables on the other side:

Their perceived knowledge about organizational management (r_p=. 371**, sig. = 0.004, N= 60); emphasis on lack of farmer motivation as an important problem (r_p=. 374**, sig. = 0.005, N= 57); the influence of political trends on decision making in the agricultural sector (r_p=. 503**, sig. = 0.000, N= 49); the priority of considering farmers' age levels (r_p=. 327*, sig. = 0.018, N= 52) and also the necessity of enhancing farmers' competencies during AD programs (r_p=. 409**, sig. = 0.002, N= 54) in the next five years. More experienced experts were finally more certain about the MAJ failure to stabilise the prices of agricultural inputs in comparison to their less experienced counterparts (r_p=. 274*, sig. = 0.036, N= 59).

6.4.6.3.2 Educational level: negative significant relationships were discovered between the educational level of experts and their perception about active participation of the MAJ in the international agricultural market (Kt= -. 252*, sig. = 0.023, N= 64) and also the success of the MAJ to stabilize the price of agricultural inputs (Kt= -. 244*, sig. = 0.021, N= 67). Experts with higher education levels put more emphasis on increasing the level of farmers' education (Kt=. 231*, sig. = 0.036, N= 63) and executing the five year AD plans appropriately in the future (Kt=. 232*, sig. = 0.037, N= 63).

6.4.7 Research question five: the implications of the findings for a competency profile of AEIs

Although, AD changes and problems discussed previously are mainly about administrative and policymaking issues, and not directly related to the roles of AEIs (see previously mentioned tables); nevertheless, AEIs can help farmers to distinguish the real AD obstacles, their impact on farmers' activities and, more importantly, to find the best ways to overcome AD problems.

AEIs are encouraged to concentrate more on the least developed AD issues in order to adequately support their clients during extension courses. Because these aspects (least developed), if amended, will positively impact the performance of farmers in the future. They are additionally expected to have appropriate and up-to-date information and the competencies of sustainability in agriculture, farmer participation approaches, agricultural policies, and application of new technology by farmers. They are asked to present extension courses more frequently to farmers in order to equip them with new knowledge and skills. Obviously, the competencies of AEIs in these mentioned areas are of great importance.

In other words, AEIs should have the competencies to act as AD facilitator/mediator between MAJ and farmers in order to help overcome AD problems and have the competency of collaborating with other MAJ personnel in different governmental or non-governmental sectors. AEIs must be aware of the fact that they are not just part-time instructors conveying some theoretical content to farmers; instead, they must practically enhance farmers' capabilities (intrinsic factors) and assist the MAJ to set up an appropriate environment (extrinsic factors) to assure farmers are successful in the complex world of agro-business. All these can be materialized when a consolidated link is established between farmers and the MAJ, as the representative of the government, and also pertinent non-governmental organizations

6.5. Conclusions and discussion

The majority of respondents was male, had masters' degrees, were more than 40 years of age, with more than 20 years of work experience. They were mainly the employees of extension organizations of Esfahan Township and were subject matter specialist in their organizations. The experts' AD related knowledge was highest in the field of agricultural extension, rural development and agricultural management.

A great number of respondents (about 60%) cited that they had continuous contact with farmers. This percentage is far more than what Lotfi (2004) stated in his research report. The reason could probably be the selective sampling method used in the current study. Experts asserted the idea that most of the AD changes during the last decade have been relatively positive but at a very slight speed. They believed that this speed could be significantly improved in the future. Moreover, experts assigned all AD problems to be more or less prominent. It alludes to the fact that the agricultural sector is indeed suffering from various malfunctions and deficits.

However, experts stressed the lack of adequate funding and the lack of the power of the MAJ to control beneficiary dealers, unfair political influence on MAJ activities, lack of MAJ international contacts, and distrust of agricultural business for private investors. Finally it should be said that merging two previous ministries responsible for agriculture into one unique ministry (MAJ) in 2001 also created new challenges and problems and might be one of the

reasons for the indicated deficits in the MAJ. This is in agreement with Rivera and Gustafson (1991) when they contend in their book "Worldwide institutional evolution and forces for change" that new organizational problems worldwide are emerging as new changes are occurring.

In the experts' view, the MAJ has failed to address AD problems appropriately. It could be interpreted from these findings that the MAJ has put its efforts in technology-driven and not human resource development (HRD) strategies. Therefore, respondents feel it necesssary that the MAJ focus more on farmers' demanded AD problems. In more detail, they unanimously believed that the MAJ has not satisfactorily addressed sustainability in agriculture and maintenance of agricultural lands. Nevertheless, the MAJ has moderately succeeded in three dimensions of AD, which are: designing accurate national developmental plans, providing new learning technology for employees, and increasing the extent of allocated funds to agricultural projects and farmers. Experts felt that the majority of problems are extrinsic and not solvable by the MAJ alone; instead, in their view, the problems need to be addressed by many involved organizations, institutions and companies if they are to be solved. Notwithstanding, they think that HRD-related problems are most likely solvable by the MAJ alone.

The results of inferential analyses revealed that generally more experienced and educated experts were more sensitive to AD issues and problems. They stressed the necessity of farmer competency development, motivation enhancement, and sensitivity to farmers' age and education level. Additionally, they were more worried about the active participation of the MAJ on the international market, its power of stabilizing the price of agricultural inputs and the effects of political trends on it. However experts who made more contact with farmers were rather optimistic about AD evolution and the role of the MAJ in addressing AD problems. One surprising finding is that experts with higher organizational positions claimed that they have more contact with farmers; while the opposite declaration was expected. Further research may investigate and clarify such correlations and underpinning reasons.

The findings of this study offer some implications for AEIs who are supporting farmers in extension courses as well. With regard to the importance of both the intrinsic (farmer related) and extrinsic (MAJ related) nature of AD issues and problems, AEIs are asked to play a mediator role along with their basic instructional role. It means that they must, on the one hand, help farmers to facilitate AD issues by recognizing their rights, potential, and enhancing their

competencies and, on the other hand, collaborate and communicate with other involved governmental and non-governmental sectors.

Generally speaking, experts assumed that the evolution of AD in Iran over the last years was positive but much can still be done to improve the AD process. This study discovered that, for the implementation of AD in Iran, the MAJ has used more technique-based than human-based strategies. In other words, the major focus has been on technology delivery to specific, and mostly rich, farmers. Due to this fact, smallholders, who are the majority of farmers in the agro-food sector, were less supported in various aspects. So, AD approaches need to be re-arranged by taking the roles of farmers, stakeholders and entrepreneurs in the field into account. Moreover, a noticeable link between them and other correspondent private or governmental sectors in agro-business should be developed. The bottom-up policies in AD and sustainable farming supported by different organizations involved in AD are encouraged. Specifically, the MAJ needs to develop new solid regulations to support sustainability in agriculture and protect the agricultural lands. Employee motivation, international contacts of the MAJ; particularly with NGOs, trustworthiness of the agricultural sector, adequate fund allocation to AD programs, and managing the political impacts are the important issues for MAJ to address in the future.

Similarly, the government is advised to dedicate sufficient funding to the MAJ to be used in AD national programs and support the MAJ to control beneficiary dealers by ordaining overarching rules and national regulations. In addition, since, a great number of AD problems are interlocked with many other Ministries and organizations, the government should call other Ministries to implement determined policies in order to solve the problems by close cooperation with all related organizations and sectors.

MAJ is asked to provide more opportunities for AEIs to enhance their AD related knowledge and competencies by participation in relevant courses and workshops and conferences. AEIs should also have the provision of self-study material, access to new learning technology, national and international scientific trips, workplace learning etc.; this gives them the authority of being AD facilitators in addition to their regular instruction jobs in extension courses. AEIs must internalize their crucial role in the AD process and, finally, they should be evaluated based on their success in the accomplishment of those AD programs, which are linked to their

specialties as well. Finally, it is proposed that the same research be performed with a larger respondent population on a national level; if so, the findings of the research in different provinces can be compared with each other and consequently the results will be applicable for the whole country.

Changes in Agricultural Extension Services –

A survey of the views of experts♣

7.1 Introduction

Agricultural extension services (AES) can be defined as transferring information from the global knowledge base and from local research to farmers, enabling them to clarify their own goals and possibilities, teaching them to be better decision makers, and stimulating desirable agricultural development (Van den Ban & Hawkins, 1996). In the view of Nagel (1998), AES is vocational education of farmers, but more importantly it is the development of managerial and organizational competencies that will enable farmers to effectively solve their own problems. In general, AES organizations in different countries pursue the overall goals of technology transfer and human resource development, although the focus differs. Several extension experts have introduced different approaches (often, used in combination with other approaches) for implementing agricultural extension and supporting farmers. These approaches can be characterized as ministry-based or general, commodity-based, university-based, training and visit (T&V), integrated or project-based, animation rural, client-based and client-controlled, extension as a commercial service, and participatory or privatized extension (see Baxter, Slade & Howell, 1989; Benor & Harrison, 1977; Nagel et al., 1992; Rauch, 1993; Umali & Schwartz, 1994).

In Iran and many other developing countries, a combined approach is used with a focus on the ministry-based extension system; although, the combination has been more or less changing over time and has generated new problems for AES. Notwithstanding, over the past four decades, AES has become one of the largest institutional development efforts the world has ever experienced. Hundreds of thousands of AES personnel have been trained, and hundreds of millions of farmers have had contact with AES services. As countries struggle with a deteriorating public budget, the question is how effective AES is and how appropriate the funds have been invested. Effective AES involves adequate and timely access of farmers to relevant advice, along with providing incentives to adopt the new technology. Also, it should suit farmers' socio-economic and agro-ecological circumstances. It is obvious that the availability of new technology, access to modern inputs and resources, and profitability at the acceptable level of risk should be considered in AES programs (Anderson & Feder, 2004). By contrast, in many developing countries, a large number of farmers are working on relatively small plots and live in dispersed areas.

Therefore, underdeveloped transport links and the expense incurred of trying to reach farmers in their villages are common difficulties in AES. As such, the association between AES and other organizations involved in farming is not suitable in many cases. A World Bank review (Purcell & Anderson, 1997), of a large portfolio of extension projects found that extension-research links were generally weak and that neither extension nor research was sufficiently conscious of the need to understand the constraints and potentials of different farming systems. Lacy (1996) confirmed this fact and examined three models of the relationship between research and extension and finally introduced a client-oriented model to enhance the association of AES, research and also education in the future.

In many Asian countries, particularly in low-income ones, AES is struggling to reinvent itself. For decades, the AES has been given public, government-funded support to extend new technologies to farmers yet AES is also expected to be public specifically in some crucial areas like poverty reduction and ecological sustainability. However, there is a growing belief that this public support of AES and technology transfer has to be reconsidered. There is no doubt that agriculture will remain important in most Asian countries such as Iran, but since agriculture and rural development strategies are also changing, more complex and demand-oriented AES is needed in the future. This means that AES needs to undertake a diversity of objectives that go beyond transferring new technology to farmers. In this perspective, AES should establish better links with domestic and international markets; reduce the vulnerability of poor farmers; promote environmental conservation; enhance enterprise development and non-farm improvement; integrate technology transfer with other input and output affairs; train farmers with a focus on innovation; and facilitate the contact of farmers with other related institutions (Sulaiman & Hall, 2003; 2004).

The Iranian AES was established in 1953 and, like other administrative organizations, has been influenced by changes in governmental policies. In 1964, the "White Revolution" introduced by the Shah of Iran had a mainly negative impact on farmer development and agriculture. The White Revolution was a package of policy guidelines designed to facilitate the transition from an agrarian to an industrial, modern economy. The main component of the package was an attempt at land reform imposed by the central government. This was an effort on the part of the Shah to pre-empt any possible peasant uprising. The reason it was called the White Revolution

was that it was meant to be a revolutionary act without bloodshed, since it was formulated by the Shah and not by a mobilized populace (Bahramitash, 2003).

Until 1964, Iran was self-sufficient in food production, but gradually had to import food subsequent to the implementation of the White Revolution. As a result of this failure, extension agents were perceived as less effective, and they themselves became demoralised. Accordingly, farmers were less eager to accept the advice of extension personnel as trustworthy sources. This declining process continued during the Islamic Revolution as well. The revolutionary authorities stressed that they were committed to achieving self-sufficiency in agriculture through peasant agriculture and support to villagers. Since that time, extension in Iran has been punctuated by five-year national development plans with the aim of attaining agricultural self-sufficiency. Achieving this goal required competent extension personnel, planning and implementing educational programs to meet farmers' needs. Some projects executed in this regard are the Rural Islamic Councils, Co-helpers, Construction (Sazandegi) groups, Rural Youth Clubs, and extension courses (Heidari, 2000; 2001).

Similarly, Amirani (2001) declared that AES in Iran, with a history of more than 50 years (mentioned above), has still not been able to reach and support all its potential clientele. Therefore, he stressed that these services need to be reconstructed or revitalized, particularly with regard to human resource management (HRM). He iterated that tight budgets, hiring freezes, and layoffs are the reality for the current AES in Iran. Karami and Rezaei-Moghaddam (1998) supported this belief and proclaimed that poverty, which is a major cause of unsustainable agriculture, has not been quelled by the implementation of various AES projects. Correspondingly, Karami (1982) pointed out that a major cause of the low achievements of AES workers is the way they are organised and managed. AES in Iran mirrors other developing countries' extension systems in organisation and management philosophy, and therefore it is not adequately adjusted to the Iranian farming system.

Other shortcomings that have recently been uncovered in the structure of AES are the number of its personnel who have direct and interactive contact with farmers (see also Lotfi, 2004). It is obvious that due to the limited number of these professionals, agricultural extension cannot reach a large number of clients (Pezeshki-Raad & Aghai, 2002). Chizari & Mirikhoozani (1995) concluded that more competent agricultural extension professionals are needed, in order to effectively contribute to performance improvement of farmers.

Unluckily, the educational level and the qualification of the majority of agricultural professionals in most developing countries, including Iran, are low considering the assignments and responsibilities they have (Pezeshki-Raad, Yoder & Diamond, 1994). As evidence, Mohseni (1994) found that most agricultural extension personnel in Iran do not have Bachelor degrees. Additionally, he uncovered that the majority of agricultural managers in Iran hold a technical agriculture degree at the Bachelor level, and they only receive in-service training about extension and personnel management. He also studied a group of extension managers in the central province of Iran and found that they lacked confidence and an understanding of development and implementation of extension activities. He therefore, recommended that routine evaluation of agricultural managers, personnel and programs is essential.

More recently, Karbasioun and Mulder (2004b) conducted a meta-analysis research on the situation of HRM and HRD in agricultural extension organizations in Iran and recognised a number of barriers hampering HRD and HRM. They classified these barriers along the three primary dimensions of Organizational Issues, Human Resource Management Issues and Human Resource Development and Competence Issues. The results of that study were strongly considered in designing the questionnaire for the current research. The researcher et al. also carried out different studies in Esfahan, Iran and explored various aspects of AES roles and the association between farmers, different institutions, and particularly AES. They also highlighted some malfunctions in the process of information delivery to farmers and chiefly concentrated on the competencies that farmers need to deal with ongoing changes. They additionally examined the competencies of agricultural extension instructors (AEIs) to be able to support farmers appropriately in extension courses (see Chizari, Karbasioun & Lindner, 1998; Karbasioun & Chizari, 2004a; 2004b; 2005; Karbasioun, Mirzaei & Mulder, 2005; Karbasioun & Mulder, 2004b; 2005; Karbasioun, Mulder & Biemans, 2007a; 2007b; 2007c). Few studies have been carried out on AES changes and the barriers within a holistic approach. A small minority of studies have had a long-range perspective to be able to anticipate and address changes and problems in the future. Thus, in this study it is intended to take the evolution of AES during the last decade into account. The problems that have been hampering AES and that will be important in the next 3-5 years in Iran are also examined. Hence, the study aims at investigating the shortcomings and strengths of AES in Iran during the last ten years. The most important AES problems in the next five years will be carefully deliberated. Finally, the extent

to which the MAJ has addressed the problems, and is likely to address them in the future, are also examined.

7.2 Purpose and research questions

The general purpose of this study is to probe the view of experts about the evolution of agricultural extension (AES) in Iran from the year 1995 until 2005 and also the problems that have been hampering the function of AES in order to design a competency profile for AEIs. To achieve this general purpose, the specific research questions are formulated as follows:

1. *What changes has the AES in Iran undergone during the last decade?*
2. *What have been the critical problems of the AES in Iran during the last decade and which problems will be important in the next five years? Moreover, what is the priority of considering those problems in the next five years?*
3. *To what extent has the Ministry of Agricultural-Jihad (MAJ) addressed those problems so far and is it able to solve the problems alone?*
4. *What organizations or agencies are delivering agricultural training programs to farmers and how useful and cooperative are they?*
5. *What are the relationships between experts' personal traits and the AES changes and problems?*
6. *What are the implications of the findings for the competency profile of AEIs?*

7.3 Methods and data sources

The research methodology of this chapter mirrors that of the previous Chapter Six, thus, it is not repeated here and only the structure of the questionnaire, which is different, will be presented. The questionnaire used for the survey consists of several categories of questions. The topics of the questionnaire are the following (number of questions for each topic is mentioned between brackets):

1. Demographic profile questions (age, gender, level of education, organizational position, work experience, responsibilities in the organization etc.) (12)
2. Level of information of respondents in different AES related fields (10)
3. The extent of experts' frequent and interactive contact with farmers (1)

4. The extent to which different aspects of agricultural extension services have improved or unimproved during the last 10 years (25)

5. AES problems in Iran at present and in the future (100)

6. Organizations responsible for AES courses to support farmers (24)

7.4 Results

The demographic profile of respondents mirrors that of Chapter Six, thus, it is not repeated here. As below, the findings related to the research questions one to five are addressed.

7.4.1 Research question one: AES changes

Table 7.1 displays experts' opinions about the level of development observed in AES over the last decade in Iran. These items have been chosen out of a total of 25 different changes/developments that were elicited from experts using a 5-point scale in the questionnaire (1: Very decreased; 2: Decreased; 3: No difference; 4: Slightly increased; 5: Very increased). Looking at this table, it is observable that AES has slightly developed in most cases. Although, the development rate of AES is very slow. In part A of table 7.1, the first three items indicate that AES has slightly improved to instigate farmers' participation in the programs. In detail, the focus on the development of the situation for women (M= 3.7, sd= .72), encouragement of contact with farmers and innovators (M= 3.7, sd= .75) and active participation of farmers in AES programs (M= 3.6, sd= .71) have somewhat developed. In addition, items 4, 5, 6 and 7, specify that AES has, to a little extent, succeeded in becoming a trustworthy organization amongst farmers (M= 3.5, sd= .70) by providing more learning facilities for them (M= 3.5, sd= .73), and diversification (M= 3.5, sd= .65), and innovation (M= 3.4, sd= .86), in the programs provided.

In contrast, part B of the table shows the most underdeveloped AES activities. It is seen that all issues are more or less related to poor human resource management (HRM). Items 1, 5 and 7 uncover the fact that experts were not satisfied with the way AES dealt with its personnel such as their evaluation (M= 3.0, sd= .86), incentives and punishments, (M= 2.8, sd= .89) and their career contentment (M= 2.4, sd= .84). Moreover, items 2, 3, 4, and 6, indicate that AES has failed to support farmers properly in different aspects. Lack of improvement in

smallholders' support policy (M= 3.0, sd= .90), using traditional top-down management strategies (M= 2.9, sd= .76), lack of allocating adequate funding to extension projects (M= 2.8, sd= 1.07) and failure of supporting rural youth clubs (M= 2.7, sd= .84) are some instances of this fact. All AES issues mentioned above are of importance for AEIs to take into account in their instructional career during extension courses. Obviously, paying attention to those items, specifically the ones which are more likely to be the responsibility of AEIs, can enrich their role significantly. They should attempt to contact smallholder and key farmers particularly youth and women for active participation. In addition, they need to increase the diversity of educational methods and creativity of training programs for farmers.

Table 7.1 Distribution of experts' views about AES changes in Iran during the last decade

AES changes					
A. Most developed issues (highest scoring variables)	n^1	r^2	V^3	M^4	**SD**
1. Opportunities for rural women to improve their situation, position and independence	70	1	+	3.7	.72
2. Encouraging contact farmers and innovators	69	1	+	3.7	.75
3. Active participation of farmers in various extension programs	68	2	+	3.6	.71
4. Facilities for farmers to acquire new information, technology, and skills	69	3	+	3.5	.73
5. Trustworthy position of extension instruction for farmers	69	3	+	3.5	.70
6. Diversification of agricultural extension projects	68	3	+	3.5	.65
7. Innovations in extension instruction systems	68	4	+	3.4	.86
B. Least developed issues (lowest scoring variables)	n^1	r^2	V^3	M^4	**SD**
1. Continuous evaluation of personnel	68	8	0	3.0	.86
2. Prioritising small farmers as the most important target group	70	8	0	3.0	.90
3. Using bottom-up management strategies instead of traditional top-down strategies in the administrative affairs of AES	67	9	_	2.9	.76
4. Allocating sufficient budget for determined extension projects	66	10	_	2.8	1.07
5. Timely award and punishment of extension personnel to increase their job proficiency	69	10	_	2.8	.89
6. Supporting and considering rural youth clubs	67	11	_	2.7	.87
7. Employees' satisfaction with their careers	61	12	_	2.4	.84

Note: [1]Number of respondents; [2]Rank; [3]Value: (+) = developed ;(0) = neutral; (–) = underdeveloped; [4]Mean: 1= Very decreased; 2= Decreased; 3= No difference; 4= Slightly increased; 5= Very increased

7.4.2 Research question two: AES problems

The most important problems at present, in the future, and their prioritisation by the MAJ are listed in parts A, B and C of table 7.2. A total of 20 items were rated by experts on a scale ranging from 0 to 4 (0 = not important; 1= a little important; 2= moderately important; 3= very important; 4= very much important) but only the five most important problems are presented in each part of the table.

As it is discernable, again, experts identified the most crucial problems as HRM issues. Insufficient funding was the major concern of respondents (M= 3.3, sd= .94) and lack of appropriate linkage between AES, education and research centres was the second most prevalent problem for AES (M= 3.0, sd= .96). The next three barriers were related to employees' competency assessment (M= 3.0, sd= .1.04) and their motivation (M= 3.0, sd= 1.11). Finally, the fifth critical problem was lack of adequate training programs for extension employees (M= 3.0, sd= 1.00). In part B of table 7.2, the items 1, 2, 3 and 5 mirror the problems at present; nevertheless, the fourth important issue is different; experts highlighted "inappropriateness of applying AES projects" as the fourth crucial problem to be faced in the next five years (M= 2.9, sd= .93). In part C of table 7.2, there are again similarities in the issues mentioned. Insufficient funding (M= 3.1, sd= 1.00) and lack of cooperation amongst the AES, research, and education (M= 3.0, sd= .86) were the two recurring items stated again in part C (items 1 and 3). Issues 2 and 4 in part C, illustrate experts' anxiety about designing (M= 3.1, sd= .86) and implementing (M= 3.0, sd= .86) AES programs and the need for consideration by MAJ in the future. Finally, experts perceived low access of personnel to new learning facilities (M= 3.0, sd= 1.04) as the fifth AES problem to be addressed by MAJ in the next five years.

As previously said, HRM and HRD issues seemed to be the most crucial AES problems. Therefore, AEIs, as part of AES human resources, are also struggling with these unwanted problems. As other AES personnel, they lack sufficient incentives, competencies, cooperation with research centres and universities, and the opportunity to enhance their capabilities by training programs. Thus, they themselves must be supported by the MAJ if they are to be effective and competent in their job, which is delivering qualified training programs to farmers.

Table 7.2 Distribution of experts' views about AES problems

AES problems				
A. Most important AES Problems at present	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Insufficient funding for implementing agricultural extension plans by MAJ	68	1	3.3	.94
2. Lack of appropriate cooperation across extension, education and research centers	68	2	3.0	.96
3. Lack of proper competency assessment of extension employees	65	2	3.0	1.04
4. Lack of employees' motivation	67	2	3.0	1.11
5. Lack of adequate training programs for extension employees	64	3	3.0	1.00
B. Most important AES Problems in the next five years	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Insufficient funding for implementing agricultural extension plans by the Ministry of Agricultural-Jihad	68	1	3.2	.99
2. Lack of appropriate cooperation across extension, education and research centers	65	2	3.1	.98
3. Lack of proper competency assessment of extension employees	64	3	2.9	1.04
4. Inappropriateness of implementation of extension projects for farmers	68	3	2.9	.93
5. Lack of adequate training programs for extension employees	63	3	2.9	.96
C. AES problems that are of greatest importance to be addressed in the next five years by MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Insufficient funding for implementing agricultural extension plans by the Ministry of Agricultural-Jihad	69	1	3.1	1.00
2. Inappropriateness of designing extension projects for farmers	69	1	3.1	.86
3. Lack of appropriate cooperation across extension, education and research centers	65	2	3.0	.86
4. Inappropriateness of implementation of extension projects for farmers	69	2	3.0	.86
5. Low access of employees to new learning and communication Technology	64	2	3.0	1.04

Note: [1]Number of respondents; [2]Rank; [3]Mean: 0 =not important; 1= a little important; 2= moderately important; 3= very important; 4= very much important

7.4.3 Research question three: addressing AES problems by MAJ

Experts rated the role of the MAJ in addressing AES problems on average between 1.5 and 1.9 on a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much). It means that in their view, MAJ has addressed the problems to a little extent or moderately so far. In part A of table 7.3, it is revealed that in the experts' opinions MAJ has addressed

HRM problems to a limited extent. It has somewhat focused on enhancing the value of agriculture in the eyes of the public (M= 1.9, sd= 1.08), establishing training programs for employees (M= 1.9, sd= .94), applying AES programs appropriately (M= 1.8, sd= .87), allocating sufficient funding to AES (M= 1.8, sd= 1.11), and increasing personnel's access to learning facilities (M= 1.8, sd= 1.05).

In part B of table 7.3, the problems addressed least by MAJ are demonstrated. In the experts' view, MAJ has not paid sufficient attention to AES personnel development such as their motivation (M= 1.6, sd= .97) and competency assessment (M= 1.6, sd= 1.03). Farmers' financial support (M= 1.6, sd= .92) has also not lived up to their expectations. In third place, experts believed that MAJ has been suffering from lack of national (M= 1.5, sd= .83) and international (M= 1.5, sd= .94) cooperation and contacts. In parts C and D of table 7.3 the focus is on the level of solvability of AES problems by MAJ alone. Where, a wide average from 0.2 to 0.8 on a 2-pointscale (0= No; 1= Yes) was obtained. It is perceivable that all five highest solvable items in part C are HRD-related problems, which are supposed to be directly under the power of MAJ. In other words, themes such as competency assessment of employees (M= .8, sd= .41) and farmers (M= .8, sd= .40), access to new information technology (M= .7, sd= .45) and arrangement of training programs for employees (M= .8, sd= .36) and farmers (M= .7, sd= .44) are all indeed different dimensions of HRD programs. In contrast part D of the table shows that the least solvable problems were dedicated to external problems such as shortage of national (M= 0.3, sd= .48) and international (M= .4, sd= .48) contacts, shortage of investment in the agricultural sector (M= 0.3, sd= .47), low prestige of agricultural career (M= 0.3, sd= .47), and political issues (M= 0.2, sd= .43). Concerning these findings, AEIs as a group of AES personnel, who have direct contact with farmers, should attempt to address AES problems especially the ones of greatest importance and the least considered by MAJ in the past. Hence, one of the crucial competencies of AEIs would be "problem solving". Of course, they have a limited power in this respect and for the problems, which are not under their control, they can just act as "AES messenger or carrier" to inform and ask related organizations to help address those problems.

Table 7.3 Distribution of experts' views of addressing AES problems by the MAJ

Addressing AES problems by MAJ				
A. Problems that have been moderately addressed by MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Assigning low value and prestige of agriculture by the public	62	1	1.9	1.08
2. Lack of adequate training programs for extension employees	60	1	1.9	.94
3. Inappropriateness of implementation of extension projects for farmers	67	2	1.8	.87
4. Insufficient funding for implementing agricultural extension plans by the Ministry of Agricultural-Jihad (MAJ)	68	2	1.8	1.11
5. Low access of employees to new learning and communication technology	68	2	1.8	1.05
B. Problems that have been addressed to a least extent by MAJ	**n[1]**	**r[2]**	**M[3]**	**SD**
1. Lack of employees' motivation and accountability	67	4	1.6	.97
2. Lack of farmers' financial supports	63	4	1.6	.92
3. Lack of proper competency assessment of extension employees	64	4	1.6	1.03
4. Insufficient contacts with other relevant national organizations	60	5	1.5	.83
5. Shortage of International contacts by extension instruction organizations	54	5	1.5	.94
C. Problems that most likely are solvable by MAJ alone	**n[1]**	**R[2]**	**m[3]**	**SD[5]**
1. Lack of adequate training programs for extension employees	65	1	.8	.36
2. Inadequate competency assessment of farmers	64	1	.8	.40
3. Lack of proper competency assessment of extension employees	66	1	.8	.41
4. Inappropriateness of implementation of extension projects for farmers	65	2	.7	.44
5. Low access of employees to new learning and communication technology	65	2	.7	.45
D. Problems that are hardly solvable by MAJ alone	**n[1]**	**R[2]**	**m[3]**	**SD[5]**
1. Shortage of international contacts by extension instruction organizations	64	5	.4	.48
2. Insufficient contacts with other relevant national organizations	66	6	.3	.48
3. Low tendency of private sector to invest in agricultural extension field	65	6	.3	.47
4. Assigning low value and prestige of agriculture by the public	64	6	.3	.47
5. Influence of political issues on decision making about extension instruction	65	6	.2	.43

Note: [1]Number of respondents; [2]Rank; [3]M: Mean for addressing the problems: 0= nothing; 1= a little; 2= moderately; 3= very; 4= very much; [3]m: Mean for solvability of the problem by MAJ alone: 0= No; 1= Yes

7.4.4 Outline of experts' perceptions

To have an overview of experts' perceptions about previously mentioned AES issues and their importance, all sub-questions in each category (for instance 10 detailed questions for AES related knowledge and 25 single questions for AES changes etc.) were summed up and one key variable was measured for each category as is shown in table 7.4. To assure the consistency of the items in each category, Cronbach's alpha coefficient for all clusters was calculated resulting in a score higher than .81 (column 2 of table 7.4). Based on the first row of the table, respondents perceived themselves to be moderately knowledgeable in AES related fields (M= 3.36, sd= .68). The scale used for this ranged from 1 (= very little) to 5 (= very much). Additionally, as previously said, for all AES changes there is great room for improvement (M= 3.24, sd= .41) where the 5-point scale for AES changes (1= Very decreased; 2= Decreased; 3= No difference; 4= Slightly increased; 5= Very increased) was considered. It means that AES evolution during the last decade has not been adequately achieved and needs to be reconsidered. Additionally, both current and future AES problems were assumed important (M= 2.78, sd= .67; M= 2.77, sd= .61) according to the scale used (0 =not important; 1= a little important; 2= moderately important; 3= very important; 4= very much important). In addition, MAJ has not addressed the problems satisfactorily (M= 1.70, sd= .57) and therefore, the priority of addressing AES problems is considerably high (M= 2.76, sd= .65), on a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) used. Finally, using a 2-point scale (0= No; 1= Yes) experts asserted that about half of the problems are solvable by MAJ alone (M= .52, sd= .23).

Table 7.4 Expert's overall perceptions about various AES issues mentioned so far
(Number of respondents= 70)

Subject	Q^1	α^2	Nv^3	M	SD
1. Experts' AES related knowledge	10	.87	3	3.36	.68
2. Overall AES changes	25	.89	3	3.24	.41
3. Importance of AES problems at the present time	20	.92	2	2.78	.67
4. Importance of AES problems in the next five years	20	.91	2	2.77	.61
5. The extent to which MAJ has addressed AES problems	20	.94	2	1.70	.57
6. Priority of addressing AES problems by MAJ during the next five years	20	.92	2	2.76	.65
7. Possibility of solving AES problems by MAJ alone	20	.91	.5	.52	.23

Note: [1]Number of questions; [2]Cronbach's alpha; [3]Neutral value in the rate used for the questionnaire

7.4.5 Research question four: organizations involved in AES

Table 7.5 disclose the situation of eight organizations, institutions or Ministries that are more or less involved in farmers' training programs. A 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) was used for the questions in this respect.

It is shown that in the experts' opinion MAJ is the main Ministry that is presenting training programs to farmers (M= 2.7, sd= .92). Thereafter, technical vocational education (M= 1.6, sd= 1.08) and agricultural engineering organizations (M= 1.6, sd= 1.11), both with quite a lower score, are in second and third place respectively.

Nearly a similar condition is observable for the usefulness of AES training programs and the rate of cooperation with other organizations (rows two and three of table 7.5). Astonishingly, nearly all responsible organizations and Ministries have low levels of cooperation according to experts.

Table 7.5 Experts' views of the frequency, usefulness and rate of cooperation of different organizations involved in farmers' training programs (Number of respondents= 70)

Organization	Frequency of the courses		Usefulness of the courses		Cooperation with other organizations	
	M^1	SD^2	M^1	SD^2	M^1	SD^2
1.The Ministry of Agricultural-Jihad (MAJ)	2.7	.92	2.4	.92	1.9	1.00
2. Technical and vocational education	1.6	1.08	2.0	1.05	1.6	1.00
3. Agricultural engineering organization	1.6	1.11	1.7	1.05	1.5	1.02
4. Health and hygiene organisation	1.3	1.14	1.5	1.22	1.3	.90
5. Environment organization	1.1	1.00	1.3	1.09	1.2	1.03
6. Private organisations	1.0	.96	1.3	1.14	1.0	.85
7. Youth national organisation	.9	.94	1.2	1.20	.9	.87
8. Red Crescent organisation	.9	1.11	1.1	1.14	.8	.90

Note: [1]Mean: 0= nothing; 1= a little; 2= moderately; 3= very; 4= very much

7.4.6 Research question five: relationships

To see whether there is any correlation between personal characteristics of experts and their opinions about AES changes and problems, Pierson and Kendal's tau correlation tests and also kruscal Wallis and F-tests were applied and the results are displayed in three following parts:

1. Inter-relationships of expert's traits: older experts had lower educational degrees (r^-_p= - . 267*, sig. = 0.042, N= 58) and had more contact with farmers (r^-_p= .304*, sig. = 0.024, N= 56) than their more well-educated counterparts. Experts with more working experience, had lower educational levels (r^-_p= - . 277*, sig. = 0.032, N= 60) but more contact with farmers (r^-_p=. 287*, sig. = 0.029, N= 58). Furthermore, respondents who had more contact with farmers perceived themselves to be more knowledgeable in AES related fields (r^-_p=. 305**, sig. = 0.002, N= 67) and they had higher organizational positions (r^-_p=. 334**, sig. = 0.002, N= 64).

2. Relationships between experts' traits and the clustered AES issues (mentioned in table 7.4): Just one significant positive correlation was found between experts' perceived AES related knowledge and the importance of AES problems in the next five years (χ^2 = 8.566*, df= 3, Sig. = .036).

3. Relationships between experts' traits and some important AES changes: work experience, educational level, age, and organizational position were the characteristics of experts that had correlations with some AES issues.

A. Work experience: experts with more working experience were more optimistic about the trustworthy position of AES for farmers (r_p=. 350**, sig. = 0.006, N= 60) and the success of AES to hire volunteers in its programs (r_p=. 271*, sig. = 0.037, N= 60). In addition, they were more in favour of the idea that the MAJ has appropriately designed AES programs (r_p=. 258*, sig. = 0.047, N= 60) over the last decade. They put a greater stress on the increasing age of farmers as a serious current AES problem (r_p=. 415**, sig. = 0.001, N= 60) and in the future (r_p=. 315*, sig. = 0.014, N= 60).

B. Educational level: the more educated experts believed that farmers' access to information technology has decreased over last years (Kt= -. 245*, sig. = 0.030, N= 67). Moreover, they

thought MAJ had failed to implement AES projects appropriately (Kt= -. 247*, sig. = 0.026, N= 65); although this has been allocated a high priority to be redressed (Kt= .236*, sig. = 0.033, N= 67). They emphasized lack of employee motivation (Kt= .276*, sig. = 0.013, N= 64), lack of AES international contacts (Kt= -. 258*, sig. = 0.034, N= 53), low access of employees to new learning technologies (Kt= -. 228*, sig. = 0.036, N= 66), and shortage of farmers' motivation to cooperate with AES (Kt= -. 227*, sig. = 0.037, N= 66).

C. Age: older experts were more concerned about farmers' age level as a big AES problem at present (r_p=. 277*, sig. = 0.041, N= 55). They assumed that MAJ alone is able to control the unfair political impact on AES (r_p=. 279*, sig. = 0.039, N= 55) and increase the value and prestige of farming activity (r_p=. 274*, sig. = 0.043, N= 55).

D. Organizational position: experts with a higher organizational position accentuated the improvement: applying common ways of solving farmers' problems such as postal and telephone contacts (Kt= .283*, sig. = 0.014, N= 65), the use of volunteers in AES programs (Kt= .243*, sig. = 0.032, N= 63) and encouraging successful farmers (Kt= .190*, sig. = 0.056, N= 62). Comparing lower rank experts, respondents with a higher organizational position preferred to emphasise the success of MAJ in designing proper AES plans (Kt= .251*, sig. = 0.024, N= 63) and the precedence of giving attention to that in the future (Kt= .221*, sig. = 0.047, N= 65). They also stressed the increase in competency assessment of employees during the last few years (Kt= .273*, sig. = 0.016, N= 60) and the low level of farmer education as an important problem at the present time (Kt= .264*, sig. = 0.020, N= 64).

7.5 Conclusions and discussion

The respondent group was composed primarily of males over 40 years of age, with masters' degrees, more than 20 years of working experience, and who were employees of the extension organization of Esfahan Township and subject matter specialist. In addition, the target group had an adequate knowledge about agricultural extension, rural development, and agricultural management and in other relevant issues; a great number of respondents (about 60%) cited that they have constant contact with farmers. Considering the above-mentioned characteristics of experts, they were able to respond to the questions of this research appropriately.

Based on the respondents of this study, AES changes were generally positive but at a very slow rate. AES has slightly encouraged farmers to participate actively in the programs, has somehow

supported rural women via diversification and innovation of the executed projects, and to a little extent has succeeded to accelerate farmers' learning processes. However, AES has been declining during last decade in mainly HRM aspects such as employees' motivation and satisfaction, supporting smallholder farmers, allocating sufficient budget to extension projects and using bottom-up (participatory) management strategies.

The results of this study clearly exhibited the anxiety of respondents about HRM and HRD problems hampering AES. Insufficient allocated funding and lack of cooperation between AES, research, and education, were the two common current and future problems. Experts believed that employees lack the necessary competencies and incentives in their workplace, which have affected the quality of their careers significantly; notwithstanding, no remarkable plan has yet been developed by MAJ to address these deficiencies. These results confirm previous research such as the studies of Amirani (2001) and Lotfi (2004).

Based on experts' views, MAJ has moderately addressed some HRD related issues as well as designing and implementing training programs for employees and farmers, preparing learning facilities, and enhancing the value of agriculture in the view of the public. But the MAJ has not adequately succeeded to address HRM related affairs like, for example, employees' job satisfaction and establishing proper national and international contacts. Respondents also stated that MAJ is able to independently solve nearly half of the problems discussed and mostly HRD related problems, such as applying training programs for employees, due to their intrinsic (internal) nature. Nevertheless, the MAJ is hardly able to solve HRM issues, which are extrinsic (external); for instance, the MAJ does not have the power to autonomously expand its national and international contacts; manipulate the political influences on AES functions etc. Experts certified that the Ministry of Agricultural-Jihad (MAJ), technical and vocational education and Agricultural engineering organizations are presenting the most frequent and fruitful training courses for farmers. However, in terms of cooperation, they were all assessed as weak.

According to inferential analysis it was assumed that experts with greater working experience would be more optimistic about AES changes; instead, experts with higher educational degrees were more anxious in this respect. Older experts pinpointed the seniority of the majority of farmers as a critical problem where respondents with a higher organizational position thought

that AES has been relatively flourishing. Higher positioned experts also emphasized the necessity of enhancing the educational level of farmers in comparison to their lower-level counterparts.

Based on the findings of this study, AEIs, as a group within the AES' human resources of the MAJ, should be able to play various roles in addition to their original role; such as problem solver, AES change accelerator, farmers' learning facilitator, competency assessment agent, AES communicator, AES program designer, and farmer motivator. Consequently, AEIs should, first of all, have sufficient knowledge and competencies in agricultural extension and different related areas. Therefore, their technical information and skills are totally insufficient. In sum, focusing on the least developed AES issues and most important AES problems should be the cornerstone of AEIs' competency profile. This study showed that the majority of the experts who were working in AES were not extension or even social science specialists but were agronomists instead . This issue needs to be reconsidered if AES is going to become more effective for farmers in the future. Experts also highlighted this phenomenon when they claimed that the employees of AES lack some professional competencies and they suggested that a tailor-made competency assessment must be created.

Enhancing employees' motivation and satisfaction is the key to success of many flourishing companies and organizations, so, taking them seriously into consideration is of great importance for MAJ and its policy makers. Moreover, it is proposed that MAJ afford more opportunities for farmers to participate in the programs and increase its international contacts, particularly with NGOs, and attempt to intensify the trustworthiness of the agricultural sector for the private sector, thereby encouraging them to invest. Based on these findings, AES has been suffering from many intrinsic and extrinsic problems that have negatively affected its functions and effectiveness throughout the last decade. Of course, the MAJ has slightly addressed some of these problems but many of them are yet unresolved. However, merging two former Ministries responsible for agriculture (Jihad-e-Sazandegi and Agriculture), caused a major structural change and generated many problems for the newly created Ministry (Hossennejad, Fani, & Azar, 2001); therefore, this complexity in the body of MAJ needs to be addressed and overcome.

The government is assumed to dedicate more funding to MAJ in general and AES in particular. In addition, since, a great number of AES problems are similar to those of many other Ministries and organizations, the government should call other Ministries to support MAJ and solve problems collaboratively. Although, the target group of this study was selected from the most experienced and informed employees of MAJ in the province of Esfahan, the majority was not sufficiently aware of the programs of other organizations and Ministries involving farmer training. They then rated themselves as moderately informed about AES related fields. These issues could be investigated in further research. Finally, it is recommended that comprehensive research is performed to discover the most appropriate management system for MAJ with a special focus on the problematic issues of HRM and HRD recognized in this project. It is suggested that the same research be accomplished with a bigger number of respondents selected at the national level with a one to two day workshop held to give the audience the opportunity to discuss the various questions of the research via individual and group discussion sessions.

Concluding remarks of part II

Summarily, part II indicated that although the evolution of AD and AES has slightly developed since the last decade, it is nevertheless, not convincing enough. It was shown that there are still many intervening AD/AES problems and they should be addressed. According to experts most of the problems revealed here will continue to be important in the future. The MAJ has attempted to redress some of them but has not been successful in many instances. Moreover, it was concluded that not all problems are solvable by the MAJ alone, rather, there is a need for close cooperation amongst all involved organizations and ministries. Notwithstanding, the MAJ is still assumed as the most important and active ministry for farmer training. Therefore, it could be said that the MAJ is the major responsible ministry expected to achieve the rights of farmers and convince the government to intellectually support farmers. Statistical analyses of the opinions of different groups of respondents showed some significant differences among them. However, the differences were not deemed considerable enough to be considered in the competency profile of AEIs. The implications of this part, such as previous parts, will be used to develop the competency profile for AEIs. Particularly, these findings will clarify the most important future forces and ethical issues of the competency profile of AEIs in the views of experts.

Part III:
Synthesis

Overview

Part III contains two chapters (eight and nine). Chapter eight presents the HRD competency research implemented, based on McLagan's model, and results in the second version of a competency job model for AEIs. In this draft the views of 257 AEIs and other experts and managers in the agricultural-Jihad organization of the province of Esfahan are investigated via a survey questionnaire. The total response rate was 67% (172). In this research all the different elements of a competency profile (future forces, ethical issues, competencies etc.) are examined through closed questions. Additionally, open spaces are provided after each series of questions for additional comments. The third version of the competency model is used as the foundation for the final version in chapter nine. To elaborate this competency profile, in chapter nine, attempts are made to integrate the implications of other studies of this PhD project and triangulation is carried out. Therefore, chapter nine brings about a more innovative and farmer-friendly competency model for AEIs of the province of Esfahan. The guidelines for AEIs' training programs, the limitation of this PhD study and recommendations for further studies are presented. The concluding remarks close the dissertation.

Chapter eight

Towards a Job Competency Profile for Instructors♣

8.1 Introduction

Human resource development (HRD) is considered an extremely important support to change processes. This holds both for individuals and organizations. Organizations are increasingly aware of the fact that HRD plays a crucial role in their success and survival. Hence, many HRD models have been designed and developed to support employees and employers to implement HRD programs, and to contribute to their performance improvement (Bernthal et al, 2004; McLagan, 1983; 1989; McLagan and Suhaldolnik, 1989). In the majority of HRD models, much attention has been paid to competency profiles of employees. After the initial failure of the competency approach in the seventies and eighties (Biemans et al., 2004), there is a renewed interest in the concept. Arguelles and Gonczi (2000) have presented studies on competence-based education and training from Mexico, Australia, Costa Rica, France, New Zealand, and South Africa. The US Department of Education (2002) has given an overview of cases on competence-based education practices. The OECD published two books, the first giving the theoretical background of competence development (Rychen & Salganik, 2001), the second being the final report of the project, in which an overarching conceptual frame of reference of key competencies was presented. The key competence framework presented in the second book consists of the visions of society and the demands of life that define the requirements for key competencies, interaction in heterogeneous groups, autonomous action, and interactive use of tools, based on reflective action, towards successful life and a well-functioning society (Rychen & Salganik, 2003, p. 184).
UNESCO also contributed to the issue of competence development. In 2004, it organized its 47th international conference on education; on quality education for all young people. In one workshop on quality education and competencies for life, a background paper was given by Frastad (2004) on competencies for life, with a description of implications for education.

An important reason to collect data and build competency models is that they are powerful decision making tools, and can be used for self-evaluation and self-development, but also for curriculum development, course development and professional licensure (Mulder, Wesselink & Bruijstens, 2005). Competency modelling is a highly participatory process (Stone, 1997; Stone & Bieber, 1997). Many models have been developed, for different professions (Shim, 2006). The development of models of HRD for the ASTD is particularly interesting because of the multiple perspectives used in the development process.

The methodology of developing models of HRD for extension instructors has not been used before in Esfahan. The whole sector of agricultural extension is quite unknown to the HRD profession. Agricultural extension is a public service for the human resource development of workers in the agri-food sector, including farmers (Van den Ban & Hawkins, 1996). The size of the workforce in Esfahan is 1.1 million workers, of which 14.5% are working in agriculture. Most of these workers live in rural areas and have primary education only.

During the last decades, the agri-food sector has changed significantly. The economic structure of the sector has changed, as well as its labour market. Many jobs no longer exist and many new ones have been created. There is large room for improvement regarding HRD. There is a noticeable gap between the present and desired competency profiles of different employee groups in extension organizations. To explore this, several studies have been conducted and they have all indicated that no sufficient efforts have been made towards HRM (human resource management) and HRD in the agri-food sector so far (cf. Chizari, Karbasioun & Linder, 1998; Karami, 2001; Karbasioun & Mulder, 2004b; 2005; Najafi, 1991; Pezeshki-Raad, Pezeshki-Raad &Aghaei, 2002; Yoder & Diamond, 1994; Zarafshani, 2002).

In the same way, Chizari and Mirikhoozani (1995) concluded that more HRD professionals as well as AEIs are needed, and they need to become more competent to be able to more effectively contribute to the performance improvement of the agri-food sector. Supporting this idea, Mulder (2001) stated that at present, HRD professionals are required to have a broad perspective and to address multidimensional client needs. He also stated that continuing competence development is necessary for professionals to stay in touch with socio-economic and technological changes. Therefore, when there is a discrepancy between HRD professionals and the needs of their clients, productivity suffers (Koukel & Cummings, 2002). Trede and Whitaker (2000) also reiterated the fact that AEIs need to constantly develop and enhance their capabilities along with ongoing changes and challenges. They say believe that rapid changes in agricultural technology, in planning and delivery of educational programs, and in the changing structure of the farming industry necessitate agricultural extension instructors and trainers to reassess their roles and responsibility in the planning and delivery of farmers' education.

As has been stated, the intention of this study is to design a competency profile. A competency profile resembles a job profile. Job profiles essentially consist of a description of the content and structure of the profession or job category (Mulder et al., 2005; 2007). Competency profiles consist of structured overviews of capabilities that are required for successful performance of a certain job. Competency profiles can be integrated parts of job profiles.

The reasons for choosing AEIs as the target group for this study are, on the one hand, their decisive role in the development of workers in the agri-food sector and, on the other hand, their problems in fields like communication, teaching, motivation, being up-to date and having experience, and adequacy of their extension knowledge. Furthermore, large quantities of time and financial resources have been spent on extension courses during the last decades, but the effectiveness of those courses is not yet adequately perceived by many authorities; evidence shows that this problem still exists and needs to be addressed. Several studies have confirmed this phenomenon (e.g. Chizari & Mirkhoozani, 1995; Chizari, Karbasioun & Linder, 1998; Karbasioun & Chizari, 2004; 2005; Karbasioun & Mulder, 2004a, 2004b; 2005).

To understand the national scale of the AEI profession, it can be noted that there are about 3.5 million households in the primary sector, whereas about 2,700 AEIs are engaged in rural development. They are working for the Ministry of agriculture as part-time employees. These AEIs are distributed across 29 different provinces. On average, approximately 100 people are working in each province. These AEIs teach in extension courses that last between two and five days in most cases. The organisation of the courses and the selection of AEIs are regulated by law, and course directors at the local level need to comply with the regulations (Karbasioun & Chizari, 2004a).

For AEIs, only a few studies have been accomplished so far, and none of them is sufficiently comprehensive to cover the various aspects of their jobs aswell as embracing the current and future perspectives of their roles in the agricultural extension system (e.g. Arabzadeh, 1997; Karbasioun & Chizari, 2004a, 2004b; 2005; Karbasioun, Mirzaei & Mulder, 2005; Karbasioun & Mulder, 2005). In fact, this is the first attempt to implement a multi-stakeholder approach in developing a HRD model for this group of professionals in this context.

Using the development approach of the HRD models (McLagan, op cit), this study was planned to find out what future forces will be influencing the careers of AEIs, what roles they should fulfil, what outputs they should deliver, what competencies are required for being able to deliver those outputs, how these competencies can be developed and, finally, what ethical issues AEIs will face in the future. Before implementing this research, two other studies were conducted to support the findings of the current study. Firstly, the developments in the agri-food sector were reviewed by questioning sectoral experts. Thereafter, farmers were asked about the changes with which they were confronted, the strategies they use to cope with these changes, the information sources they used and the extension courses and AEI professionals. So, it is expected that given the results of these three interlocked studies and data collection with a variety of respondents such as farmers, experts, managers, and AEIs, triangulation of the data will enhance the reliability of the results and the final competency model.

8.2 Purpose and research questions

As has been said, the purpose of the wider project of which this study is one part, is to develop a competency profile for agricultural extension instructors (AEI) in Esfehan. The methodology of the project is based on the research conducted for the development of HRD models (Bernthal et al, 2004; McLagan, 1989). In the total project we have questions about: 1. the competencies that are essential for AEIs during the next 3-5 years; 2. the principal outputs for various roles of AEIs; 3. the quality requirements (standards) that are essential for producing and delivering outputs; 4. the future forces that will influence the work of AEIs during the next 3-5 years; 5. the ethical issues that are relevant for the job performance of AEIs in the coming 3-5 years. The project will result in guidelines for the design of curricula and training programs for AEIs.

In this specific study amongst experts, the research questions are about the following topics: 1. the influence of future forces on the role of AEIs; 2. the relevance of outputs for the role of AEIs; 3. the importance of standards for these outputs; 4. the importance and required level of expertise of competencies of AEIs; 5. the relevance of ethical issues with which AEIs will be confronted. Experts were expected to answer these questions in terms of a 3-5 year time frame.

8.3 Methods and data sources

As to the research methodology, it was mentioned before that the role study approach performed by McLagan (op cit) is being used in this study. Given the generic nature of these role studies, it is assumed that this methodology of competency profile research can also be employed in specific sectors.

The core of this methodology is that large groups of experts and professionals are being surveyed to assess future forces that influence the work of selected HRD professionals (i.e. AEIs), their outputs, their competencies, the standards (quality requirements), and ethical issues. The questionnaires were adapted to the context of the study. The structure of the survey instruments was maintained as much as possible.

Since this study concentrates on the development of a competency profile for AEIs, the role of 'instructor' was selected from the HRD models. The questionnaires were adjusted to this role and distributed among three experts at Wageningen University and twenty-two experts of the Ministry of Agricultural-Jihad and also of the Ministry of Science, Research and Technology. The review and refinement of the questionnaire took three months. It helped to make the questionnaire valid for the role and context of AEIs.

Finally, the questionnaire was translated into Persian and a copy of the translated questionnaire was distributed to a group of seventeen experts in the province of Esfahan for review and improvement. This led to various clarifications in the translated draft. All ambiguities in the translation were eliminated. Much rewording and rephrasing was done to prevent misunderstanding by respondents upon completing the questionnaires. Furthermore, to assure the reliability of the items, Cronbach's Alpha Coefficients were measured for all clustered questions and, as a result of the scores, some questions were deleted to keep the alpha coefficients higher than .70.

In total, 257 experts from 16 of the 19 townships in Esfahan were selected for this study, 100 managerial experts, and 157 expert AEIs. To make sure the participating experts were well informed, the following selection criteria were used: a minimum of five years of working experience, teaching experience in extension courses, or research conducted or publications made about agricultural extension instruction.

The questionnaires were distributed by post to the addresses of the experts in the relevant townships. The data collection phase lasted from April until June 2005. Eventually, 184 questionnaires were returned and 12 uncompleted questionnaires were eliminated. So, a total of 172 complete questionnaires was collected (=67% response), which were analysed. Descriptive techniques were used to analyse the data first. Next, the reliability of the items in the clusters of questions was tested with Cronbach's Alpha Coefficient. Finally Chi-square Tests, Spearman Rank Correlation Coefficients and Mann- Whitney Tests were performed to explore the relationships between the different variables.

The questionnaire that has been used for the expert survey consists of several categories of questions. The topics of the questionnaire are the following (number of questions for each topic is mentioned between brackets):

1. Background data of experts (such as age, gender, level of education, present position in the organization, work experience, responsibilities in the organization, level of expertise and/or experience, experience in teaching extension courses) (16);
2. Importance of future forces for the role of AEIs (18);
3. Relevance of outputs of AEIs (11);
4. Importance of standards for outputs of AEIs (89);
5. Importance and level of expertise of competencies of AEIs (28);
6. Relevance of ethical issues for the role of AEIs (14).

8.4 Results

In this section the results will be presented. First, the background of the response group will be presented.

8.4.1 Background of respondents

With respect to demographic characteristics of the respondents, 92% are male, 67% have a bachelor degree, 58% are between 31-40 years of age, 57% have between 5-15 years working experience, 92% have teaching experience; 64% work as technical experts, and 7.1% hold a managerial position. As to the educational background, 34% have a major in agronomy, then

animal husbandry (14%) and then horticulture (11%); only 3% have majored in agricultural extension. A considerable percentage of respondents are employees of agricultural extension organizations (30%); 10% are in plant protection and also 10% work for the agronomy section. Considering the geographical distribution, most respondents are from Esfahan (31%), Semirom (9%), Kashan (9%) and Shahreza (8%).

Regarding the knowledge of respondents about the field of study, self assessment questions were asked about their level of knowledge in agricultural extension instruction, agricultural extension in general, and agricultural development. The average scores on these knowledge domains are 4.2 (sd=.71), 4.1 (sd=.65) and 4.1 (sd=.59) respectively. The scale used ranges from 1 (=minimum) to 6 (=maximum).

Experts were asked about the fruitfulness of extension courses for their beneficiaries, and the majority was positive about the added value of these courses (average= 4.5; sd = .79; 6-point scale used, 1=minimum; 6=maximum).

8.4.2 Future forces that influence the role of AEIs

A total of 18 future forces were presented to the experts. They were asked to rate these on a scale with a range of 1 to 6 (1=not important; 6=essential). On this scale, a score of over 4.5 can be regarded as very important (4=moderately important; 5=very important). Of the total number of future forces, 10 were rated, on average, as being very important (minimum average 4.7, maximum average 5.3) (see Table 8.1).

The majority of these future forces are related to content-driven change processes, such as productivity improvement, moving towards food processing and mechanization of production processes, the use of information and communication technologies by producers, the wish to join the World Trade Organization and the globalization of the agri-food market. Other future forces are profession intrinsic, such as more interactivity, variation in instructional technology, emphasizing new competencies of workers in the sector, and quality improvement of instruction. So, a wide circle of trends is seen as influential, varying from global developments, market developments, technological development, micro-economic developments, and AEI-professional developments.

When designing a competency profile for AEIs, it is necessary to take these developments into account.

Table 8.1 Assessment of future forces by experts

Future force	F[1]	R[2]	M[3]	SE[4]	SD[5]
1. Increased emphasis on the need to improve the capability and productivity of farmers	165	1	5.3	.06	.82
2. Increased need for active interaction with farmers that necessitates changing traditional styles of instruction to new interactive and practical approaches	166	2	5.2	.07	.97
3. Increased sophistication and variety in instructional technology (using instructional tools, methods and media)	168	2	5.2	.07	.88
4. Developing and supporting industries related to agriculture such as food processing and mechanization technology	168	3	5.0	.08	1.05
5. Increased use of computers and internet by extension organizations for consulting, supervising, managing and educating farmers	167	4	4.9	.08	1.11
6. Increased use of computers and internet by farmers in their activities	166	5	4.8	.08	1.06
7. Joining the World Trade Organization (WTO) and commitment to compliance with its principles and conditions	166	5	4.8	.08	1.09
8. Emphasis on new competencies of farmers like creativity, risk taking, adaptation to change, teamwork and sensitivity to their environment	166	5	4.8	.07	.96
9. Globalization of agricultural activities and tasks, like increased and expanded international co-operation and communication, joint ventures, overseas ownership, and international competition	166	6	4.7	.08	1.11
10. General expectation of quality improvement of agricultural instruction	167	6	4.7	.07	.91

Note: [1]Frequency of respondents; [2]Rank; [3]Mean 1=not important; 2=very little important; 3=little important; 4=moderately important; 5=very important; 6=essential; [4]Standard Error; [5]Standard deviation

8.4.3 Ethical issues with which AEIs will be confronted

HRD professionals all have to deal with ethical issues, such as ensuring truth in claims, data and recommendations, showing respect to others, and responsibility for accurate information that has added value for the client.

This holds for both western and non-western societies and for primary production (think of food safety and sustainable production) and services (such as not selling certain services developed at the cost of certain clients to other clients).

In the agri-food complex the balance of ethically sound, and economically feasible processes is often summarized with the triple P acronym, which stands for Planet-People-Profit. This expresses the need for a sustainable agri-food sector, in which profitability is not the only criterion for doing business, but that corporate social responsibility, including smallholder integrity, is needed for the production of sufficient, safe and healthy food.

Table 8.2 The extent to which AEIs will be confronted with ethical issues according to experts

Ethical issue	F[1]	R[2]	M[3]	SE[4]	SD[5]
1. Ensuring truth of claims, data, and recommendations	167	1	2.8	.03	.37
2. Committment to delivering an effective course for farmers and helping them to be aware of new changes on their farms and in their environment	166	1	2.8	.03	.36
3. Showing respect to farmers in all circumstances	167	2	2.7	.04	.49
4. Feeling responsibility for collecting the newest and practical information and relaying it to farmers in extension courses	168	2	2.7	.03	.46
5. Being available for farmers and solving their difficulties after completion of courses so that the farmers can use information appropriately	168	2	2.7	.04	.52
6. Avoiding conflicts relating to farmers' customs, expectations and needs	167	2	2.7	.04	.49
7. Balancing organizational and individual needs and interests	167	3	2.6	.04	.57
8. Showing respect for, interest in, and presentation of individual and population differences	167	3	2.6	.04	.51
9. Being sensitive to direct and indirect effects of intervention and acting to address negative consequences	166	4	2.5	.04	.56
10. Ensuring farmer involvement, participation, and ownership	167	4	2.5	.04	.58

Note: [1]frequency of respondents; [2]Rank; [3]Mean 1=not relevant; 2=moderately relevant; 3=considerably relevant; [4]Standard Error; [5]Standard deviation

In total, 14 ethical issues were presented to the experts, who were asked to rate their relevance for the future roles of AEIs (see Table 8.2). Of these, the average score of 10 ethical issues was 2.5 or higher. On the three-point scale used, an average score of 2.5 or higher can be regarded as considerably relevant.

8.4.4 Competency needs of AEIs

To explore the competency needs of AEIs, 14 competencies were presented to the respondents. The ten competencies which rated over 2.5 on the scale are presented in Table 8.1. The results presented in this table are evident.

The vast majority of the original competency list is perceived of as being important for the competency profile of AEIs. The level of expertise required varies between 4.7 (4=average) and 5.5 (6=maximum), which means the competencies should be mastered to a relatively high degree.

It is not surprising that subject matter understanding scores highest (although the differences in importance with the other competencies is small), given the background of the experts. Presentation skills are amongst the top three competencies needed in much labour market research in general.

Understanding the business of the target group is essential for providing services with added value. Most of the other competencies are specific for the work of human resource development specialists (like understanding learning processes, feedback skills, relationship building, adult training and development, and objective preparation), although they are also relevant for other development workers. These competencies should play an important role in designing programs for professional development of AEIs.

Table 8.3 Importance and required level of expertise of competencies of AEIs

Competency	Importance		Level of expertise	
	M[1]	SD[2]	M[3]	SD[2]
1. **Subject Matter Understanding**: Knowing the content, importance and feasibility of a given function or discipline being addressed	2.8	.45	5.5	.96
2. **Presentation skill**: Presenting agricultural information orally and in a suitable way to farmers so that the intended purpose is achieved	2.7	.47	5.2	.91
3. **Business Understanding** : Familiarity and understanding various aspects of farming, characteristics, difficulties, sensitivities and challenges in agriculture	2.7	.45	4.7	.96
4. **Learning Understanding**: Knowing how adult farmers acquire and use knowledge, skills, attitudes; understanding individual differences in learning	2.7	.48	4.9	.90
5. **Feedback Skill**: Communicating information, opinions, observations, and conclusions so that they are understood and can be acted upon by farmers	2.7	.52	4.9	1.03
6. **Intellectual Versatility**: Recognizing, exploring, and using a broad range of ideas and practices; thinking logically and creatively without undue influence from personal biases	2.7	.49	4.9	.88
7. **Relationship building skill**: Establishing relationships and networks across a broad range of farmers	2.6	.50	4.9	.95
8. **Self-knowledge**: Knowing one's personal values, needs, interests, style, and competencies and their effects on others	2.6	.54	4.9	.96
9. **Adult training and Development**: Understanding theories and techniques used in training and development for farmers	2.6	.57	5.2	1.13
10. **Objectives Preparation skills**: Preparing clear statements which describe desired outputs for farmers	2.5	.55	4.7	.97

Note: [1]M=Mean for importance: 0=not important; 1= little important; 2= moderately important; 3= very important; [2]SD=Standard deviation; [3]M=Mean for level of expertise: 1= nothing; 2= very little; 3= little; 4= average; 5= much; 6= very much

8.4.5 Relevance and standards of outputs of AEIs

The respondents were asked to assess 11 outputs (see Table 8.4). It will be clear that outputs and competencies are related. Outputs are products or services that AEIs are expected to deliver. Competencies are the capabilities of AEIs to deliver those products and services. So, presentation of instructional materials as on output requires presentation competence.

Table 8.4 Importance of outputs of AEIs

	Output	M [1]	Sd [2]
1	Presentation of instructional Material	2.9	.35
2	Feedback to learners	2.8	.35
3	Equipping farmers with new knowledge, skills, attitudes after the course	2.8	.62
4	Using teaching methods and delivery of instructional materials	2.8	.39
5	Encouraging and managing individual action plans for learning transfer	2.8	.45
6	Facilitation of media-based learning events (such as videotapes, films and audio-tapes	2.7	.43
7	Facilitation of farmer group discussion sessions	2.7	.46
8	Supporting learning environments	2.7	.50
9	Test delivery and feedback	2.5	.53
10	Facilitating group members' awareness of their own group process during the group discussion sessions	2.5	.55
11	Facilitation of structured learning events for farmers (such as case studies, role-plays, games, simulations, and tests)	2.5	.57
	Average	*2.7*	*.47*

Note: [1]M=Mean for importance: 0=not important; 1= little important; 2= moderately important; 3= very important; [2]SD=Standard deviation

The relevance of the outputs given to the respondents is evident. All eleven outputs are rated on average between 2.5 and 2.9 on a 3-pointscale (1=not relevant; 2=slightly relevant; 3=very relevant). A large number of standards (between 6 and 11 for each output) were distinguished. Examples of these standards are:

For presentation of instructional materials: the extension facilitator makes adaptations in using instructional materials according to the unique requirements of the specific farmer group (level of education, age, culture, interests); instructional material used for teaching is updated and in accordance with new scientific achievements; the learning points are clear, accurate, and organized.

For feedback to learners: feedback is supported by specific, practical and understandable examples; it is given in a respectful manner to the farmers, according to adult education principles; it can be used to make on-the-job behaviour changes.

For equipping farmers with new knowledge, skills, and attitudes after the course: after finishing the course individuals are able to apply new learning; individuals are able to perform learnt issues on the farm practically; farmers are able to produce more products (quantitatively and qualitatively).

Cronbach's alpha coefficients for each output were measured, and varied between .70 and .88. The importance of all standards varied between .7 and .8 (minimum=0; maximum=1). This means they are all viewed as being important.

8.4.6 Differences between sub-groups of experts

To compare the views of experts with different personal traits about future forces, ethical issues, competencies and outputs mentioned earlier, firstly all items in the relevant tables were summed up and for each table one representative variable was calculated. The Cronbach's Alpha for all issues was higher than .70 confirming the consistency of the categorized items.

Then the respondents' views were compared based on their age, level of education, gender, organizational position, working experience and teaching experience to see if there were any differences amongst their opinions. Statistical methods such as Mann- Whitney U, Kruscal Wallis and F (one way ANOVA) tests were used for data analysis.

• *Age:* one significant difference was found between age and respondents' opinion about ethical issues (F= 1.646, df= 27, sig. = .034).

• *Organizational position:* significant differences were recognized between organizational position and experts' views about outputs ($\chi2$ = 7.182, df= 2, Sig. = .028) and level of specialty of competencies ($\chi2$ = 5.905, df= 2, Sig . = .050) needed for AEIs.

• *Working experience:* one significant difference was measured between working experience and expert's opinion about level of specialty of competencies (F= 2.178, df= 25, Sig. = .002) for AEIs.

• *Education level, gender and teaching experience:* no significant difference was achieved between the abovementioned traits and the experts' views about any of the components of AEIs' competency profile (future forces, ethical issues, etc.).

8.5 Conclusions and discussion

The intention of the project of which this study is one part, is to develop a competency profile for AEIs in Esfahan. It is expected that the methodology used can be used again to scale the study up to national level. The introduction of small scale, in-depth interviews with selected key experts will add to the quality of the study, as has been shown in other research (Mulder, Wesselink & Bruijstens, 2005). The most important purpose of a large scale survey is to reassure the trustworthiness of the final profile. But a limited number of targeted in-depth interviews reveal the majority of the competencies needed already. This observation is confirmed in this project too.

In this study, a representative number of experts have given their views on future forces that will influence the role of AEIs in the near future, ethical issues with which they will be confronted, the importance and level of expertise required of AEIs, and outputs that need to be delivered by AEIs. It was found that the experts' perceptions were primarily analogous as few notable differences were found between the various sub-groups of respondents in this study.

The questionnaire used was based on other HRD model studies (McLagan, op cit). The draft questionnaires were reviewed and criticized by various experts, and the final version was a result of extensive evaluation and redesign. But this process paid off, since it is evident that most of the elements included in the questionnaire were rated as being important. The vast majority of the contextual factors, such as various content-related and profession-oriented developments, views on ethical concerns, statements about required outputs and the list of competencies are regarded as being important. So, the information of this study can very well be used during the deliberation process that will take place to decide upon the competency

profile. Studies with other perspectives, such as interviews with the recipients of the services of AEIs, which are also implemented, will be used to triangulate the data of the total project.

The next step is to design effective professional development programs for AEIs. Based on other research it is know that formal courses alone are probably not sufficient or the most effective for the development of AEIs (Karbasioun, Mirzaei & Mulder, 2005; Lans et al., 2004). So the challenge is to design learning trajectories in which competencies that are relevant for delivering added value for the recipients of the service of AEIs will be developed. We think a combination of formal and informal professional development may be most effective. This should be supported by appropriate measures at the level of the extension organisation and human resource management of extension personnel (Karbasioun & Mulder, 2004a). Important elements of the competency profile of AEIs, based on this survey amongst experts, are content-related competence, and instruction-related competence. Both need to be addressed in the professional development program that will be designed, especially because the data showed that most of the AEIs are agricultural experts instead of extension experts. The present list of competencies, together with the importance and expertise ratings, can already be used to design self-assessment tools for existing AEIs. At a later stage the competency requirements can be further formalized, eventually for professional licensure, if this is desired by the actors involved.

Chapter nine

Final Version of a Competency

Profile for Instructors in Esfahan

9.1. Introduction

In the previous chapters, different studies were carried out in order to provide reliable raw material for the last stage, which is developing a competency profile for AEIs in the next three to five years. Therefore, the project was started with a wide review of national and international literature taking the situation of HRD and HRM in agricultural extension in Iran into account (chapter one) and then presenting seven empirical studies in chapters two through eight. Throughout this research there has been an emphasis on data triangulation in an attempt to posit an AEI competency profile. This process is described in more detail below.

In Part One of this thesis project the focus was on farmers (participating and non-participating farmers in extension training programs during the year 2004) as the main target group of the four studies of part one. Through this first part the focus of attention was on farmers, the primary audience of AEIs, to see their perceptions of the kinds of changes and difficulties they must face, information sources, coping strategies, type and extent of support they have received from the MAJ and AES and also their expectations from the MAJ and AES. Inquiries were also made into their opinions about their own competencies. Additionally, selected participating farmers were interviewed to discern what they think of the ideal characteristics of a competent AEI and what they perceive of the most recent AEI whom they have met in extension courses. To find out the opinion of non-participating farmers in extension courses a pilot study (chapter two) was carried out and 27 farmers were interviewed in order to assess their view-points. Subsequently a larger number of participating farmers (102) were interviewed (chapters three, four and five). Generally speaking, the major reason for studying farmers was that they are the basic target group of AEIs and can therefore give helpful information about them and their required competencies. Consequently, four different studies were conducted solely amongst farmers.

In Part Two of the research (chapters six and seven), two empirical studies were carried out with agricultural experts, managers and AEIs in the province of Esfahan. Through these studies, the evolution of agricultural development (AD) and also agricultural extension services (AES) in Iran during the last decade was examined. The policies, strategies, regulations, trends, supports, shortcomings and strengths of AD and AES, the organizations involved in training of farmers and their roles in supporting farmers were likewise investigated. Of these inquiries, the major aim was to study the context and environment of the work of AEIs; the challenges,

difficulties and constraints that impact their instruction role. Finally, part three is composed of the last two chapters (eight and nine) to synthesise the previous chapters for the PhD project. Chapter eight contains the competency profile study for AEIs following McLagan's research studies (McLagan, 1983; 1989; 1996; 2000; McLagan & Suhadolnik, 1989). The research group of this study consisted of the entire AEI population and a number of selected experienced agricultural experts and managers in agricultural organizations within the province of Esfahan. Because the McLagan HRD model works best with a large number of respondents, a group of 257 respondents was queried. The findings of this study formed the starting point for developing the final version of the competency profile for AEIs (chapter nine); the studies from the previous chapters of this Thesis triangulate and elaborate the model and give a prevailing competency profile for AEIs in the next 3-5 years. Therefore, the findings from the studies with farmers and experts were used to elaborate the HRD competency model derived from chapter eight in order to provide a trustworthy synthesis in chapter nine. The triangulation of the project in the final version of the competency model is portrayed in figure 9.1 below.
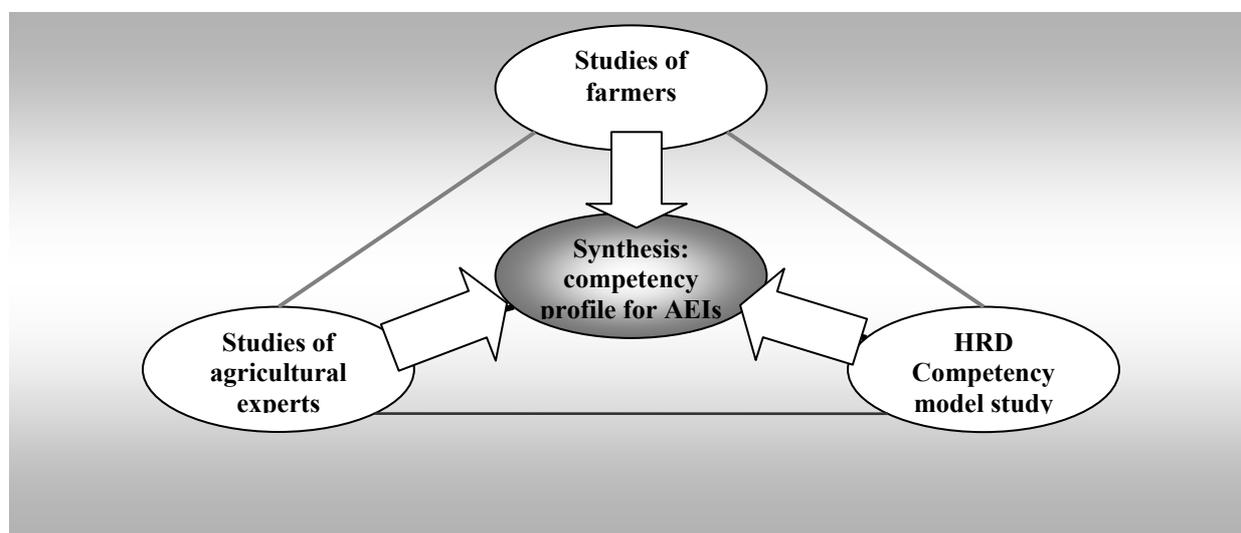
Figure 9.1 Triangulation of the final version of the competency model for AEIs

To achieve this model, first the competency profile developed in chapter eight was taken as the basis of the model and it was then complemented, adjusted and modified as a result of the findings from other related studies. For more clarity, the different components of the model have been categorised into a number of main groups which are listed according to their

priorities measured in chapter eight. Pertinent items from different chapters have been placed in their relevant categories. Sub-categories have also been added for those items from which extra detailed implications are deduced from various chapters. Therefore, future forces, ethical issues, outputs and competencies will be categorized, prioritized and integrated with the findings of other studies. To determine standards (quality requirements), the results gained from chapter eight will be presented for each output. They thereafter will be discussed in light of the other studies of this thesis as well. The diagram below gives an overview of the components of the proposed competency profile and the relationships between the different components.
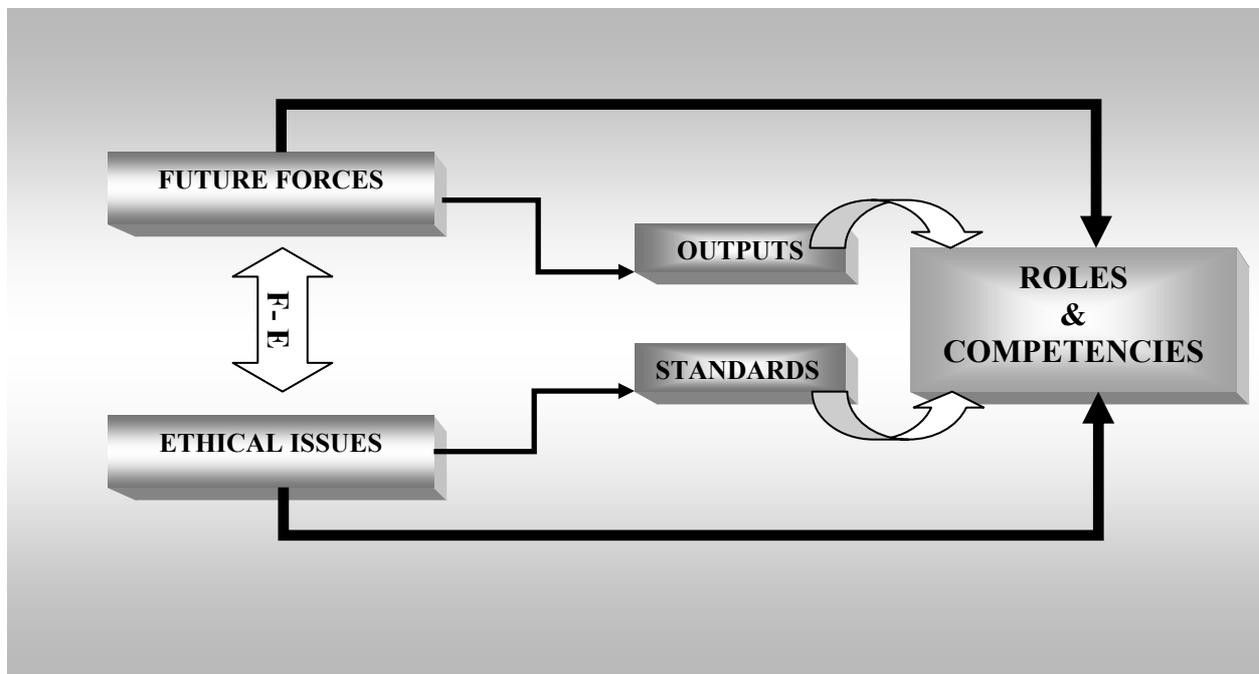
Figure 9.2 Relationship amongst different components of competency profile

It should be clarified here that a (generic) competency profile in this research (as already noted in chapter one) contains different elements (future forces, ethical issues, outputs, standards, roles and competencies) that all together lead us to the final list of (specific) competencies. Therefore, developing a competency profile not only includes competencies but also various attributes as illustrated in figure 9.2. Of course the specific competency profile will be the most important outcome of the model.

As already mentioned, the competency lists outlined will be analysed and discussed carefully to increase their applicability and feasibility for the farmers' situations. According to the above diagram, we start with future forces and ethical issues that externally influence other components of the model as well as competencies. Then we continue with outputs, standards, roles and finally end up with competencies.

9.2 Future forces

Two external components of the competency model are future forces and ethical issues. These significantly influence the competencies of AEIs and their roles. In other words, the demands and constraints of the future and also ethical aspects of the instruction role of AEIs have a noticeable impact on the competencies and roles of instructors.

Hence, these two components externally affect the competencies of AEIs and require AEIs to overcome those future pressures and ethical dilemmas in order to be successful in their jobs. Of course, the external influencing factors are not solely limited to these two issues; rather, many other elements such as social, economic, and psychological issues also intervene. Nevertheless, in this research these two items will be used due to their importance on methodological grounds as well. Referring to the findings of chapter eight, all investigated future forces examined in our study were rated as moderately to very much important ($5.3 \geq M \geq 4.1$) on a six-point Likert scale (1= not important & 6= Extremely important) for AEIs in the next 3-5 years.

These future forces are prioritised based on the scores they were allocated by experts in chapter eight. Other studies conducted as part of the larger project, particularly chapters six and seven, elicited remarkable implications from respondents about current and future AD and AES changes and problems. Based on chapter eight (HRD competency model study) a total of 17 future forces were distinguished as vital for the role of AEIs in the next 3-5 years. They are divided into three groups as "farmer- related" (FRF), "AEI-related" (ARF) and "MAJ-related" (MRF) future forces. In the table below these categories are listed. In addition, the supporting chapters and some new detailed future forces are illustrated in sub-categories or sub-groups of each category.

In part A of table 9.1, farmer-related future forces (FRF) are described. In this part, improving the technical competencies of farmers is mentioned as the first priority of future forces. Some of the other studies also confirmed this fact; chapter two emphasized the competencies of application of inputs on the farm and chapter three underlined improving the competencies of the educated children of farmers. Number four of part A also presents some general competencies that could be important in the future for farmers. In this part the need for more interaction between farmers, more frequent use of computers and the internet by farmers, and reducing the tendency to hire family members in farm activities are stressed as other future forces that would be directly related to farmers.

In part B, future forces, which are related to AEIs (ARF) are expressed. In this part, the focus of attention is on the importance of improving instructional technology and the tools used by AEIs, enhancing the quality of learning of farmers in extension courses, and increasing the diversity of farmers and addressing their expectations, demands and motivations in extension courses by AEIs.

In Part C, the biggest part of table 9.1, twelve main items related to MAJ (MRF) are listed. Most of these items are supported throughout this thesis too. However, more specifications for some items such as number five (need for paying more attention to HRD), number eleven (necessity of giving more support to the elderly, smallholder and poorly educated farmers) and number eleven (need for more trustworthiness in, and power of, the MAJ) of part C are recognizable in comparison to others and are listed below each item as the sub-groups.

Summarily, table 9.1 reveals that both farmers and experts perceive that most of the future forces they were questioned about are related to the MAJ and they expect the MAJ to take them into account. In general, it could be seen that farmers (in chapters two to five) have mainly emphasized parts A and B of the table (farmers and AEI related future forces); whereas, experts in chapters seven and eight stress the importance of part C which concerns future forces related to the MAJ (MRF). However, it must be noted that this phenomenon is, to some extent, due to the content of their questionnaires.

Table 9.1 Future forces of the competency profile of AEIs

Future forces

A. Farmer-related Future Forces (FRF)	Supportive Chapters
1. Increased emphasis on the need to improve the technical capability and productivity of farmers	**2-3-4-5-6-7-8**
1.1 The necessity of improving the knowledge and skills of farmers to use inputs on the farm properly	2-3-4-5
1.2 The need for increasing the farm-related capabilities of educated children of farmers	3
2. Increased use of computers and internet by farmers in their activities	**8-7**
3. Emphasis on new general competencies of farmers like creativity, risk taking, adaptation to change, teamwork and sensitivity to their environment	**3-4-6-7-8**
3.1 Increased cooperation of farmers and AES/AEIs	3-4-7
3.2 The need for higher motivation of farmers to continue their job	3-4-6
3.3 Increased attention to sustainable agriculture by farmers	4-6
3.4 The importance of enhancing the general education level of farmers	3-5-6-7
4. Decrease the tendency to get help from family members on the farm	**3-4-5**

B. AEI-related Future Forces (ARF)	Supportive Chapters
1. Increased need for active interaction with farmers that necessitate changing traditional styles of instruction to new interactive and practical approaches	**5-6-7-8**
2. Increased sophistication and variety in instructional technology (using instructional tools, methods and media such as books, brochures, photos, movies)	**3-4-5-8**
3. Increased general expectation of quality improvement of agricultural instruction	**4-5-6-7-8**
3.1 The need for improvement in examination methods, instructional technology, length of extension courses and the combination of participants	5
3.2 The need to give greater attention to teaching farmers about crop production and then applying inputs on the farm in extension courses	5
4. Increased diversity in target groups of agricultural instruction	**4-5-7-8**

4.1 Necessity of recognising the two major reasons for farmers attending extension courses; personal development and performance improvement	5
4.2 The need for more incentives for poorly educated and female farmers to actively participate in extension courses	4-5-7

C. MAJ-related (MRF)	**Supportive Chapters**
1. Developing and supporting the industries related to agriculture such as food processing and mechanization technology and new demands for agricultural instruction	**3-4-6-7-8**
2. Increased use of computers and internet for consulting, supervising, managing and educating farmers by extension organizations	**6-7-8**
3. Joining the World Trade Organization (WTO) and commitment to the execution of its principles and conditions; new challenges for agricultural instruction	**8**
4. Globalization of agricultural activities and tasks, like increased and expanded international co-operation and communication, joint ventures, overseas ownership, and international competition	**3-6-7-8**
4.1 Increased marketing of agricultural products in national and international markets	3-6
5. Scale development that results in the necessity to pay more attention to strategic human resource management issues	**2-4-5-6-7-8**
5.1 Necessity of increasing the motivation of extension personnel	7
5.2 Necessity of allocating sufficient budget to extension projects	5-7
5.3 The need for shifting towards bottom-up management strategies from top-down traditional strategies in AES	7
5.4 The need for determinant evaluation of personnel	7
5.5 Assigning higher value and prestige to agricultural jobs by the government and, as a result, by the public	7
5.6 Necessity of increasing contact between research, education and extension	2-7
6. Necessity of having more flexible and broad organizational hierarchy in extension services as well as instruction	**6-7-8**
7. Increasing attention to the key role of rural women in agricultural production and their help in farming activities	**6-7-8**
8. Increased pressure on making profit in the private sector, and budget pressure in governmental organizations	**2-6-7-8**

8.1 The need for increasing the trustworthiness of agriculture to encourage private sector investment	6
8.2 Privatization of services including agricultural extension instruction	2-8

9. Reducing the number of personnel and more emphasis on smaller, effective and independent working groups of extension organizations **7-8**

9.1 Necessity of having adequate numbers of extension specialists compared to technical experts	6-7
9.2 The need for having more experts in the townships	6-7
9.3 Increased need for fruitfulness of extension programs such as rural youth clubs, rural Islamic councils, construction groups and constructional army	4-7

10. Necessity of giving more support to farmers; particularly elderly, smallholder and poorly educated farmers by MAJ **2-3-4-5-6-7**

10.1 Necessity of stabilizing the price of agricultural inputs	2-6
10.2 The need for improvement of the quality of different agricultural inputs	2-3
10.3 Necessity of financial support to smallholder farmers	3-4-5-6
10.4 Initiating cottage industries and smaller manufacturers near farms	3-6
10.5 Reducing the risk, labour and severity of farming for farmers	4-6
10.6 Increasing the need for allocating more funds to AES to support farmers	6-7

11. The need to increase the trustworthiness and power of the MAJ **2-3-6-7**

11.1. The need for increasing the trustworthiness and power of rural councils	3-7
11.2 Necessity of preventing the settlement of industries or residential sites on farmlands	6
11.3 The need to control unfair beneficiaries such as dealers and mediators in the agricultural sector	2-3-4-6
11.4 Necessity of decreasing unfair political influence on the agriculture sector	6-7

9.3 Ethical issues

Ethical issues are another group of external factors, which intervene in the competency profile of AEIs in our study. These ethical items refer to the sensitivities of the roles of AEIs and moral dilemmas they confront during their instructional activities. These delicate issues could, on the one hand, indirectly prevent the success of AEIs if they are neglected or, on the other hand, raise AEIs' success if sufficient and timely attention is dedicated to them. As previously said, ethical issues play an important role in the job profile of AEIs and they need relevant

competencies to be able to deal with them appropriately. A total of 14 ethical issues were perceived to be important for the roles of AEIs in the next 3-5 years, ten of which were presented in chapter eight. These ethical issues are listed below according to the priority attributed to them in chapter eight. Of course, some ethical issues are common for a variety of jobs and they are more fixed in comparison to others that significantly differ for every job. As with the future forces, the implications of the studies carried out amongst farmers and experts have also been added to table 9.2 to complement the findings with other perspectives.

In table 9.2 the ethical issues are divided into two "general ethical issues" (GE) and "course-related ethical issues" (CRE) main categories (parts A and B). GE refers to ethical issues which concern the role of instruction of AEIs both in and out of the courses. They might be related to farmers or employees of the MAJ and other individuals, groups and organizations. CRE are mainly linked to extension courses, participating farmers in the courses and other related ethical issues during or after the courses. As with table 9.1, for each ethical issue the corresponding chapter relevance is listed and, where needed, they are added to the table as sub-groups. The items are listed according to their priorities acquired in chapter eight. Table 9.2 shows that both farmers and experts agree with the fact that AEIs will face many general and course-related ethical issues in their roles as instructors in the near future. It could be said that respondents differed in their emphasis on the importance of course-related issues and general ones. In part A, sub-groups are also given for items two, three, four, and nine in which issues two (showing respect to farmers and avoiding conflict irrespective of who is at fault) and four (being sensitive to the direct and indirect effects of intervention and acting to address negative consequences) encompass more detailed implications from other studies. Part B of the table contains course-related ethical issues and has only one main category comprising 16 sub-groups. The main ethical issue item refers to the "commitment of AEIs to present effective courses to farmers". As it can be seen, most of the indications in this part come from chapters five and seven which have a greater focus on extension courses and their characteristics. In total, based on part B of the table, it is concluded that in the view of different respondents, the course-related ethical issues are of greatest importance for the role of AEIs. It is seen that they have a close relationship with future forces and also competencies needed for the roles of AEIs in the future. Therefore, being acquainted with these ethical dilemmas and knowing the strategies to appropriately address them will be assumed to be the capabilities of AEIs in order to overcome ethical conflicts in their jobs.

Table 9.2 Ethical issues of the competency profile of AEIs

Ethical issues

A. General Ethical issues (GE)	Supportive Chapters
1. Ensuring truth in claims, data, and recommendations	**2-3-5-8**
2. Showing respect to farmers and avoiding conflict irrespective of who is at fault	**2-3-5-8**
2.1 Being sensitive to the limitations of female farmers with regard to their participation in courses due to their duties in terms of housekeeping, looking after children; avoiding conflict with their husbands' beliefs and concerns	3-5-7
2.2 Being sensitive to farmers' customs, expectations and needs	4-5-8
2.3 Showing respect for, interest in, individual and population differences	2-3-6-7-8
3. Balancing organizational and individual needs and interests in behaviour	**3-6-7-8**
3.1 Being properly motivated (AEIs themselves) to teach farmers	5-7
4. Being sensitive to direct and indirect effects of intervention and acting to address negative consequences	**3-5-8**
4.1 Concentrate on smallholders as well as bigger farmers; attempt to support smallholders who really need help	2-3
4.2 Avoiding political issues intervening in dealings with farmers	6-7
4.3 Making sure that there is no confliction between AES programmes and those presented by other involved organizations	5-7
5. Maintaining appropriate confidentiality in dealing with farmers	**5-8**
6. Showing respect for copyrights, sources, and intellectual property	**8**
7. Saying "no" to inappropriate requests	**8**
8. Feeling accountable to help the ministry of agriculture prevent beneficiary dealers swindle farmers	**3-4-5-6**
9. Using power appropriately to support farmers' rights and help them to apply their teachings effectively in the future	**5-8**
9.1 Feeling responsible to help farmers solve their financial shortcomings by feasible means	2-4-5-6-7

B. Course-related Ethical issues (CRE)	**Supportive Chapters**
1. Having commitment to present effective and fruitful courses for farmers	**3-4-5-6-7-8**
1.1 Feeling responsibility for collecting the most up-to-date and practical information and giving it to farmers during extension courses	8-6-7-5
1.2 Ensuring farmer involvement, participation, and ownership in the courses	1-3-6-8
1.3 Ensuring that participating farmers are fully motivated to learn new ideas and subjects	5-6-7
1.4 Ensuring that explanations are provided for older and less educated farmers	2-3-4-5-7
1.5 Being committed to broaden information sources and coping strategies of farmers	3-5
1.6 Being on time during the presentation of courses and informing farmers in advance in case the instructor is absent	5
1.7 Using understandable (if possible local) language in the courses and speaking clearly, simply and articulately	5
1.8 Ensuring that the course environment is appropriate and convenient for farmers	5-6-8
1.9 Applying suitable teaching methods, instructional technology and examination strategies during courses	5
1.10 Being committed to increase the satisfaction of farmers and reduce the risk, labour and severity of their work through the courses	4-5-6-7
1.11 Assuring that the highest priority and most topical subjects are presented to farmers	4-5
1.12. Having commitment to provide opportunities for rural women to improve their situation, position and independence	5-7
1.13 Ensuring innovations in presenting extension courses	5-7
1.14 Assuring youth and key (contact) farmers are encouraged and actively participate in the courses	6-7
1.15 Being sensitive with applicability and fruitfulness of the instruction for farmers and doing follow-up to make sure that farmers are sufficiently capable and willing to follow the lessons learned after the courses	5-6-7
1.16 Having commitment to be available for farmers and solve their difficulties after finishing the course so that the farmers can use what they are taught appropriately	5-8

9.4 Outputs

As it was noted in the general introduction chapter, outputs are products or services that an individual or group delivers to others, especially to colleagues, customers, or clients (McLagan, 1989, p 77). It could be said that certain outputs are ingredients of each role and without them the role is not satisfied.

According to chapter eight, eleven outputs were selected as important and very important (2.9 ≥ M ≥ 2.5) on a three point scale used in the questionnaire (1= not important; 2= important & 3= very important) for AEIs in the next 3-5 years. Output number ten of table 8.4 in chapter eight (facilitating group members' awareness of their own group process during the group discussion sessions) has been merged into sub-group number four of part B of table 9.3. Also, output number eleven of table 8.4 in chapter eight (facilitation of structured learning events for farmers such as case studies, role-plays, games, simulations, and tests) is re-located to sub-group number three in part A of table 9.3. All of the mentioned outputs are categorized into three main parts.

Part A includes instructional technology-related outputs (ITO); part B contains instructional methods-related outputs (IMO) and part C includes farmers' competency development outputs (FCDO). Again, the connotations of other chapters are considered in the table and sub-groups are presented under each main item where necessary. It is clearly perceivable that part B (IMO) and also part C (FCDO) are of great importance. Nevertheless, the first and second parts of the table (parts A and B) could be presumed as prerequisites for achieving the outputs mentioned in part C.

 In other words, AEIs could succeed in developing essential competencies of farmers and as a result improve their performance through the application of appropriate instructional technology and methods in the courses. If so, they can establish a positive and supportive environment in extension courses in order to strengthen farmers' indigenous (local) knowledge with up-to-date and applicable competencies.

Table 9.3 Outputs of the competency profile of AEIs

Outputs

A. Instructional technology-related outputs (ITO)	Supportive chapters
1. Presentation of instructional material during the courses	**2-3-5-6-7-8**
1.1 Provision of facilities and instructional materials for extension courses	5-6-7
2. Facilitation of media-based learning events (such as videotapes, films and audio-tapes)	2-3-5-6-7-8
2.1 If applicable embedding new information technology such as internet connection in their courses	3-5-6-7

B. Instructional methods-related outputs (IMO)	Supportive chapters
1. Timely feedback in a clear and understandable way to farmers	**5-6-7-8**
2. Using diverse and appropriate teaching methods and delivery of instructional materials based on the availability of the teaching material and farmers' preferences	**5-6-7-8**
3. Encouraging and managing individual action plans for learning transfer	**5-8**
4. Facilitation of farmer group discussion sessions	**5-8**
5. Test delivery with practical and helpful feedback in order to support and encourage farmers to perform properly in their real work after the course	**5-8**
5.1 Implementing follow up after the courses	2-3-5-7
6. Arranging farmer-friendly learning environments in order for farmers to be relaxed and comfortable during the courses	**5-6-7-8**
6.1 Provision of a convenient environment for female farmers, and elderly or lower educated farmers	3-6-7
6.2 Motivating farmers particularly women, smallholders, lower educated and key farmers for higher participation in courses	5-6-7

6.3 *Arranging extra individual visiting plans for those farmers who are not willing or able to attend group courses for some reason*	2-3-5-7
6.4 *Considering diversity in extension courses tailored for different groups of farmers such as youth, women, lower educated farmers etc.*	5-6-7
6.5 *Providing more space for farmers to learn things by doing (in practice)*	3-4-5

C. Farmers' competency development outputs (FCDO)	**Supportive chapters**
1. Equipping farmers with new knowledge, skills, attitudes	**2-3-4-5-6-7-8**
1.1 *Equipping farmers with new knowledge and skills of food processing, packaging, small manufacturing, application of different agricultural inputs on the farm and using new farming technology and marketing*	3-6-7
1.2 *Equipping farmers with "the knowledge of sustainable agriculture", "the ways of enhancing satisfaction and reducing the risk and severity of agriculture career", "knowledge and skills of animal husbandry", and knowledge about different extension projects in farmers' areas such as "construction army" and "rural youth clubs"*	4-6-7
1.3 *Finding the most recent and useful knowledge for farmers via internet and, if possible, teaching farmers to use internet as a new learning and information technology themselves*	3-6-7
1.4 *Making a reasonable link between up-to-date research (which originates from universities and research centres) and indigenous knowledge of farmers*	6-7

9.5 Standards (quality requirements)

According to the McLagan research studies' model, each "output" contains a number of "standards" or "quality requirements". These standards ensure that the expected outputs of AEIs are carried out comprehensively. The standards for each main output (table 9.3) were carefully investigated in the competency profile study (chapter eight); therefore, other parallel studies did not explicitly investigate them due to their complexity, detail and length. The idea, that distinguished standards are of great importance for the competency profile of AEIs is

supported by a high percentage of respondent congruity on all of the questioned standards. This facilitates the realisation of appropriate standard outputs. However, the "Mean" of standards rated equal to, or higher, than ".7" (not relevant= 0 & relevant= 1) which shows that about 70% of respondents perceived the questioned standards to be relevant for obtaining standard outputs. The total number of standards presented in the questionnaire varied from 6 to 11. Also the Cronbach's alpha coefficients for each output was measured and varied from .70 to .88 which confirmed the consistency of standards questioned for each output. These standards, which are the requirements for the appropriate performance of AEIs, are presented based on their importance for each output as described in subsections 9.5.1-9.5.9. Additionally, explanations and examples are given in order to make them more compatible with the situations of farmers.

9.5.1 Standards for output one (presentation of instructional material during courses)

Four standards were assumed to be important for output one.

● *AEI makes adaptations to instructional materials according to the unique characteristics of the farmer group (level of education, age, culture, interests, etc).*

This issue was stressed in different chapters of the dissertation as well as chapters three, four and five. So, it is important that the instructor selects the most comprehensive and interesting instructional material for the specific audience group participating in the course. This gives AEIs the opportunity to differentiate and designate instructional materials for each demographic category of participating farmers in the courses. For instance, using flip-charts is more attractive and understandable for lower educated farmers; technical journals can be used as instructional material for higher educated farmers. Also, youths prefer more active teaching methods such as role playing and instructional games in comparison to adult farmers.

● *Instructional material used for teaching by AEIs should be up-to-date and allude to new scientific achievements.* This point accentuates the need for AEIs to be up-to-date and use new and approved knowledge and skills when preparing instructional material for farmers. Therefore, the prepared instructional materials should be checked from time to time to ensure they are accurate and updated by AEIs.

● *Learning points are clear, accurate, and organized.* This is also important that the instructional messages are clearly given by using specific instructional material. AEIs should

not forget that the main objective of using these materials is not only their attractiveness; rather, they are used to support the learning process and should help the instructor to express his/her educational points accurately.

• *The relationship between the taught subjects and farming are established.* This standard again highlights the need for the applicability of the lessons in the courses for farmers. They do not attend the courses to just learn some theoretical jargon without any positive impact on their real work. Thus, AEIs should always consider the application of the subjects being discussed, In doing so, individual issues, concerns, and expectations about the material's content should be carefully recognized and addressed.

9.5.2 Standards for output two (facilitation of media-based learning events)

Different groups of media such as audio-visual media, non-audio-visual media, software or hardware media, personal, group, and mass media can be used in training programs. Although, there is a big debate about the effects of media and methods in teaching activities and whether they are replaceable or not, the role of media in supporting the learning process, especially for adults, is reported by many researchers (Clark, 2001). The crucial point however is the proper application of these media by instructors in order to support the learning process. Thus, in extension courses, appropriate and reasonable connections should be made between the instructional event and on-the-job farming issues of the participating farmers. Therefore, the purpose of using instructional media has to be in line with farmers' real problems. Moreover, transitions between media segments and other portions of the instructional program should be smooth. It is also important that the instructional technology tools are tested before starting the course and that the instructional objectives of using media are clear. AEIs must be able to operate equipment properly and provide back-up systems or contingency plans to be used in the event of equipment failure. Again the selected media must be compatible with the characteristics of participating farmers. To achieve these standards, AEIs must have reasonable knowledge about the roles of the media and mediators in education and their associated pitfalls.

9.5.3 Standards for output three (timely feedback in a clear and understandable way to farmers)

Feedback to farmers is another requirement of the roles of instructors. Instructor's feedback should be clearly communicated to the audience and given as soon possible after the event. It

should be supported by specific, practical and understandable examples and delivered in a respectful manner (self-esteem is maintained or enhanced) to farmers according to the principles of adult education. Moreover, general questions and problems of farmers should be taken into consideration by AEIs as group feedback and paid more attention by AEIs. In sum, farmers need to be convinced by the feedback of the instructor and feel free to ask any kind of questions they might have about the subjects during the course. AEIs must speak articulately and simply when responding to questions and let farmers ask their questions any time during the session. They will probably forget their questions if they are asked by AEIs to wait until the end of the session.

9.5.4 Standards for output four (using diverse and appropriate teaching methods and delivery of instructional material)

As a preliminary rule of training, the instructor should be able to use diverse teaching methods during the course and continuously evaluate the suitability and effectiveness of the teaching methods. This helps AEIs to change methods to more appropriate means where needed. Additionally, farmer participation in the teaching procedure should be taken into consideration by AEIs. Instructors should have the necessary information and skills for teaching and be able to comprehensively answer farmers' questions about the subject by using different instructional approaches. As mentioned earlier, unique characteristics of farmers (age, level of education, interests, etc) should be considered in the selection of teaching methods to make sure they are suited to the learning needs and interests of farmers. As a matter of fact, and based on the findings of part one (studies of farmers) of this thesis, farmers mostly prefer learning by doing and practice-oriented courses. They also appreciate interactive and media-based learning such as documentary movies, showing slides, charts, posters and so on. Hence, using a combination of methods can make learning smoother and more interesting for farmers.

9.5.5 Standards for output five (encouraging and managing individual action plans)

This output underlines the importance of the indigenous knowledge of farmers and the necessity of considering this method during extension courses. Through this output AEIs let individuals share their useful experiences with other farmers and AEIs in a mutual way. Hence, it is highly recommended for AEIs to take this output into consideration in their instruction role. An individual action plan should be properly linked to the on-the-job needs of participating farmers and supervisory supports should be identified by instructors. Farmers

should be motivated to talk about their experiences in the courses and encouraged to introduce their innovative solutions for the problems that they have encountered on their farms. AEIs can help volunteer farmers to describe legitimate standards, timetables, and measurements for their presented action plan.

9.5.6 Standards for output six (facilitation of farmer group discussion sessions)

The group discussion session is assumed as one of the most common educational strategies in extension systems. It is a very interactive, adult-friendly and indirect teaching method and does not need any specific instrument or accommodation. In addition, the farmers' self-confidence is enhanced and reinforced by being in a group where there is enough flexibility for AEIs to respond to group needs and issues as they arise. To have a successful discussion session, farmer participation should be encouraged and appreciated. Each group member should feel valued and listened to and see that his/her self-esteem is maintained or enhanced. Adequate time should be provided for discussion, debriefing, and application. In addition, rights of individual and group members should be respected and farmer group members should feel the experience is meaningful and beneficial in their real lives. The instructor in this method is a facilitator and director of the group of participating farmers. Farmers are the ones who play the major role of the learning and teaching process which makes this learning strategy very exceptional and challenging.

9.5.7 Standards for output seven (test delivery with practical tendency and helpful feedback)

Although, extension courses are not considered official training programs as those offered in schools and universities, examinations should still be considered as indications of learning. Chapter five already stressed the re-organization of the examination methods that AEIs use in their courses. Farmers believed that more practical tests must be carried out by AEIs after finishing the courses. Another standard is that a follow-up evaluation should be planned to ensure that farmers have appropriately learned the subjects and have succeeded in applying their knowledge in real life. So, it is important that the competencies being tested are relevant and clearly defined when farmers are on-the-job. Instructors should give timely and relevant feedback to participants if farmers have any questions about the structure and content of the test. Finally, justification for tests and possible uses of test results should be clearly communicated to participants. Farmers must realise that an exam is only one criterion for

achieving the competencies intended from the course and a way to support accurate learning. It is not intended to pressurise or humiliate farmers.

9.5.8 Standards for output eight (supporting learning environments)

AEIs, as specialists in farmer education, are specifically expected to provide a suitable learning environment for farmers. They may check the location of the courses upfront and send pertinent remarks to extension personnel in order to ensure they have a convenient learning environment. This issue was also supported by chapters five, seven and eight and presented in part C of table 9.3. As has frequently been said, learning environments should be supported by making a noticeable linkage with the reality of farm life and it's problematic issues. The course location should be comfortable in terms of temperature, seating, noise level, distance from farmers and so on (chapter five). In addition, the farmers' self-esteem must be maintained or enhanced during the course. Finally, farmers should have an informal and cordial environment so that they feel safe to try new skills and share their experiences with others. The standards of AEIs should encourage farmers to actively participate in extension courses until the last day and make them enthusiastic to attend further courses.

9.5.9 Standards for output nine (equipping farmers with new knowledge, skills and attitudes)

After finishing the course, individuals should be able to apply new learning issues and perform them in the farm situation independently. They are expected to produce more agricultural and animal products both in terms of quantity and quality. Consequently, participants should be informed about the newest and most relevant information on the subject by the end of the course. The new knowledge and skills that farmers receive will vary based on the type and topic of the course on offer. Overall, within each course there must be a number of common and overarching knowledge areas and skills addressed such as marketing, communication and management. Though extension courses are basically focused on developing farmers' knowledge they can, nonetheless, in some special cases, also focus on innovative knowledge especially when speaking of new topics that need to be introduced to farmers. However, courses must be built upon a farmers' indigenous knowledge if they are to be adopted by them. Production enhancement is one of the most important goals of extension courses, however, at the same time, poverty reduction is also crucial for a large number of smallholder farmers. So, increasing the knowledge and skills of farmers targets the livelihood improvement of poor

farmers along with production improvement on a larger scale; the extent varies based on the kind of farmers that AEIs are dealing with. All of these areas should, of course, contribute to the improvement of sustainable agriculture in the long-term.

9.6 Roles

Because the "instructor/facilitator" is the key role of AEIs, the model developed here is built upon the instruction role of AEIs derived from the McLagan study (1989, The Models book, p.49) in which she describes the role of instructor/facilitator as "presenting information, directing structured learning experiences and managing group discussion and group process". More explicitly, "farmers' Instruction role" can be defined as:

> "Using formal/informal instruction and other learning experiences to support client acquisition of knowledge and skills; translating technical jargon into non-technical terms and giving interesting and easily understood presentations; in sum, giving instruction to farmers could be defined as the introduction of new ideas, information, and tasks to challenge the existing perceptions of clients (Shim, 2006, p. 204)."

Although, the abovementioned definitions are rather traditional and not competency-based, they have heretofore been the cornerstone of extension education in Iran and many developing countries. As will be discussed later, this concept of instruction needs to be changed significantly to become more competency-based and be able to address the new worldwide changes in the agricultural sector.

However, the respondents of this PhD project (chapters one to seven) characterised a number of other roles for AEIs. However, most of these roles were deemed to be encompassed within the role of "farmer instruction" when the model was adjusted and translated for the AEIs in Iran in chapter eight. Hence, endeavours were made to make the role of AEIs correspond to informal and adult learning areas, which require training approaches other than formal learning. Some indicators from the studies of farmers and experts for the roles of AEIs are discussed below.

9.6.1 Implications of studies of farmers and experts

The following roles were perceived as important for AEIs with regard to the different studies of farmers and experts. Some of these roles could be considered as so called "sub-roles" of the instruction role of AEIs (as previously mentioned) such as "media facilitator", "program planner", "educational needs analyst", "program evaluator" , "instructional technologist", "course examiner", "teaching methods specialist", and "course designer". Some others might be listed as different roles like "animal and agricultural technical advisor or counsellor", "extension communicator/net-worker", "problem-solver for farmers", "extension mediator", "HRD developer", "farmers' leadership builder", and "farmers' indigenous knowledge developer".

The abovementioned roles illuminate the fact that AEIs should not be assumed as just trainers of farmers in some short-term and incidental courses; rather, they are supposed to accomplish a variety of educational activities and roles in order to support farmers efficiently in their real work situations. As we discussed earlier, the adjusted role of "instructor/facilitator" was the main focus of this study. This role, to be efficient, has to be integrated, to some extent, with the previously mentioned roles and address the complexity of the job, outputs and competencies of AEIs. In the next section, the most necessary competencies for the roles of AEIs are exhibited.

9.7 Competencies

As was already cited, the most important part of the competency model is the list of competencies that empower the target group to bring about the anticipated job. Obviously, all components of the competency model interact and so it could be said that the competencies are closely related to outputs, future forces, and ethical issues that are required for the whole model. Based on chapter eight, a number of competencies were generally identified as important and very important ($2.9 \geq M \geq 2.5$) on a four-point scale (0=not important; 1= little important; 2= moderately important; 3= very important) and they are depicted in table 9.4 based on the priorities measured in chapter eight. Concerning the level of expertise, the "Mean" of all the competencies mentioned were rated equal to or higher than "4.5" on a six-point scale (1= nothing; 2= very little; 3= little; 4= average; 5= much; 6= very much).

According to chapter eight fourteen competencies for the role of AEIs were distinguished as important or very important. As with the previous list of competencies (resulting from chapter eight) these were categorised into sub-groups and the inferences from other studies (chapters) were integrated into the list as in table 9.4 (in the right column the chapters that highlighted the issues are presented). As it illustrates, three main categories for competencies are distinguished. They are entitled "general course-related competencies" (GCC), "general competencies" (GC) and "technical competencies" (TC). As it is perceivable, GCC are kinds of general or overall competencies along the lines of course design, teaching skills and evaluation skills for the instructional AEI role. GC includes more common competencies, like relationship and communication skills, which are important for a variety of roles and not just the instructional AEI role. Finally, TC is related to specific scientific areas that require specialist competencies, for example plant breeding or veterinary specialists. In Part A, items one to ten indicate different common course-related competencies. The majority of these items were also considered (in table 9.3) as outputs resulting from competencies. Therefore, once again, the close relationship of these two elements of the competency profile is evident. The competencies of part A will empower AEIs to deal successfully with participating farmers during courses. Part B, of the table, includes eight general competencies of AEIs that the respondents perceived important for AEIs to be able to support farmers, not only during the extension courses but, also out of the courses, in farmers' real life situations and in other instances of farmer activities on the farm. It is seen that the items in part B are mainly related to the personality of AEIs and can be, to some extent, learned. Finally, part C refers to technical competencies, which are very important and without which all other competencies will be rendered useless or of no added value. These technical competencies can also be divided into to two major groups. The first group pertains to very specific technical knowledge and skills in which the course is aimed at teaching farmers on topics such as irrigation, animal breading, and healthy milking. The second group comprises the overarching and common technical competencies like information about climate change and knowledge of soil structure and its characteristics. However, to have technical competencies, AEIs should preferably be subject matter specialists and posses adequate experience in the area that they are supposed to teach farmers. Therefore, both farmers and experts perceived the prominence of three kinds of competencies as discussed above. Different chapters support the idea of multi-functionality of AEIs inside and outside the extension courses and the need for possessing various technical and non-technical competencies.

Table 9.4 Competency lists proposed for AEIs (specific competency profile)

Competencies

A. General course-related competencies (GCC)	Supportive chapters
1. Presentation skills: Presenting agricultural information orally and in a desirable way to farmers so that an intended purpose is achieved. This competency was illustrated as one of the important outputs in table 9.3 and its standards were described. However, shifting from traditional and one-way presentation of pre-planned lessons to more interactive and two-way methods is stressed in this competency. Therefore, AEIs should be skilful in participatory approaches in presenting the courses.	5-6-7-8
2. Farmers' learning understanding: Knowing how adult farmers acquire and use knowledge, skills, and attitudes and understand individual differences in learning. So, the competency of dealing with farmers, their limitations, sensitivities and expectations from AEIs and extension courses are required.	2-3-5-7-8
2.1 Familiarity with the culture, language and real problems of farmers. To have this competency, it is recommended that AEIs who are born in the farmers' surrounding area or have experience of working with the farmers of that region be selected to be able to establish good communication with them.	5
3. Feedback skill: Communicating information, opinions, observations, and conclusions so that they are understood and can be acted upon by farmers. This was also discussed as one of the important outputs for the role of AEIs. This competency necessitates AEIs to be, not only, good speakers but also good listeners and respondents. They should be competent in accurate and timely feedback to farmers in courses.	5-8
4. Adult training and development: Knowing the theories and methods used in training and understanding their use for farmers. Because the majority of participating farmers in extension courses are adults, knowledge and skills in adult education would be a crucial competency which is needed for AEIs. So, they should not only have the knowledge of adult education but also the skills to apply it.	2-3-5-8
5. Objectives preparation skills: Preparing clear statements which describe desired outputs for farmers. It highlights the importance of addressing applicable objectives of farmers through different ways as well as presenting appropriate statements about the desired outputs. AEIs should generally follow the main objective of the course; although, they might be asked to address many other problems facing farmers. A competent instructor will still manage to address the major aim of the courses within the timeframe of the course.	5-8

6. Performance observation skill: Tracking and describing farmers' behaviours and their effects. This competency is extremely important for AEIs and indicates that instructors of farmers do not follow the traditional transfer of theoretical (often impractical) information to farmers; rather, they should mostly focus on putting learning into practice and have the capability to carefully observe a farmers' performance and address their shortcomings and difficulties in their real situations on the farm.

4-5-7-8

7. Questioning skill: Gathering information by stimulating insight into individuals and farmers' groups by the use of interviews, questionnaires, and other probing methods. Without this competency AEIs will not be unable to assess the real problems of farmers and prioritise them. Thus, questioning skill helps AEIs to be accurately aware of farmers' activities, problems, limitations and interests. Then they can concentrate better on the most essential issues during extension courses.

5-8

8. Coaching skill: Helping individuals (farmers) recognize and understand personal needs, values, problems, alternatives, and goals. This competency is in line with the philosophy of agricultural extension in which an extension agent should support farmers to find the problems and solutions themselves and extension agent would only be facilitators and supporters for farmers. In other words, he/she helps farmers to help themselves and be successful in their jobs.

2-4-5-8

9. Group process skill: Influencing groups of farmers so that tasks, relationships, and individual needs are addressed. This competency was also previously described as an output of AEIs. Because AEIs normally deal with a small group of farmers in extension courses, the competency of working with groups, its sensitivities, interpersonal relationships, applying instructional methods that are suitable for groups, knowing advantages and disadvantages of group learning processes are all the abilities that an AEI should have. This competency is again a common capability for all instructors. Nevertheless, adult educational theory should be integrated and taken into consideration for AEIs.

2-5-8

10. Program planning: Designing appropriate plans for courses, which include topics, time, teaching methods, and exams. AEIs, teach farmers in courses that take only a few days. This makes their role more difficult; because they have to do their instructional job intensively and with the best time management. Therefore, the competency of course design and program planning for a certain course is necessary for AEIs. It improves AEIs' time management and also provides an outlook for both farmers and extension personnel of what, when and where things will be done,.

5

B. General competencies (GC)	Supportive chapters

1. Intellectual versatility: Recognizing, exploring, and using a broad range of ideas and practices; thinking logically and creatively without undue influence from personal biases. It could be realised that this competency and other further competencies of part B are mainly inherent and personality-oriented; nevertheless, they can, to some extent, be learned. Instructors of farmers should be able to innovatively arrange the courses in a way that the experiences of farmers are encouraged and they can benefit from each others' shared experiences. This needs intellectual versatility skill.

5-8

2. Relationship building skill: Establishing relationships and networks across a broad range of farmers and other governmental or non-governmental individuals or groups who are involved in the agricultural sector. This competency could be assumed as a key skill for other general competencies. AEIs can help in the provision of essential instructional tools, accommodation, experts, budgeting and, increase the active participation of farmers in courses by establishing proper relationships with different stakeholders in the field.

5-6-7-8

3. Self-knowledge: Knowing one's personal values, needs, interests, life style and competencies and the effects of these on others. In other words, the competency of recognizing their own personal weaknesses, strengths and unique characteristics. This competency helps AEIs to recognise and reinforce their strengths and try to improve their weaknesses by means of self-regulated or supported plans. This would also alert AEIs to be careful with the unexpected negative influence they might have on farmers by their behaviour while dealing with farmers (ethical issue number four of part A of table 9.2).

8

4. Communication: Establishing desirable contacts with different individuals, groups and organizations. Communication is also one of the basic and common competencies, which is necessary for a wide range of roles and jobs. For AEIs, communication with contact farmers, rural leaders, youths, adults, extension personnel and other organizations' personnel provide instances of this important competency. Another notable issue is that AEIs should also be able to teach farmers how to communicate with others.

2-3-5-7-8

5. Management: The ability of properly integrating human and physical resources in the organization. As previously mentioned, AEIs are expected to manage both human and physical sources available in order to bring about effective learning opportunities for farmers and enhance their capabilities.

2-5-6-7

5.1 Human resource management skills: The effective use of human resources for both extension personnel and also farmers in order to enhance the effectiveness of extension courses and, as a result, to increase the competencies of farmers after the courses. The AEI is the person who decides (sometimes in consultation with AES' personnel) how to categorise participating farmers in the course, what kinds of incentives are to be provided to learners, how to evaluate the courses, how to involve the

4-5

majority of farmers in course activities, how to support less communicative farmers, and how to help farmers after the course. All these decisions necessitate AEIs to have the knowledge and skills of human resource management.

5.2 Farm management skills: The knowledge and skills to integrate different inputs (human and physical) on the farm in order to get the most benefit out of farming activities. Decisions like how many part-time or full-time workers are hired, how much and what kinds of inputs such as pesticides, seeds, fertilizers are used, what kinds of agricultural and animal products are produced are all related to this competency in which an AEI should be able to help farmers in their decision making procedure.

3-4-6-7

5.2.1 Financial management of the farm: Knowledge of financial affairs and economic issues of farming such as changes in the price of inputs and outputs and intervening factors. It is obvious that an increase in production does not necessarily bring about an increase of income. So, AEIs should generally help farmers look at the business and economic issues of their work and be aware of the demands and challenges of the market. To do this, AEIs will need this competency.

3-4-6-7

6. Research skills: Capability of using the most efficient methods for collecting useful and new information and technology in order to be used by farmers. AEIs, in order to enhance their technical competencies and knowledge, should be good researchers too. They must know about and be able to find recent and relevant innovations and advances in farming. The competency of research in scientific journals, on the internet, conference proceedings, workshops and so forth is a skill AEIs are expected to possess after university and continue to develop through workplace learning and learning by doing at a later stage.

2-3-5-7

7. Knowledge of governmental regulations and policies: Familiarity with the updated MAJ regulations about farming, loans, insurance, stabilised input and output prices and so forth. Because most farmers are older and poorly educated, their information about governmental (MAJ) policies and regulations is usually insufficient and out of date. Therefore, farmers expect AEIs to let them know about the latest changes in policies that regulate their rights and opportunities as determined by the MAJ.

2-3-4-6-7

8. Knowledge and skills of new information technology: Having information and skills about computers, internet, online learning and education, and other new technologies which can be used by AEIs in their courses or provided as supporting information outside of the formal teaching environment. Although it looks too early for the majority of Iranian farmers to be professional users of computers and other kinds of new information technology, nevertheless, it must be regarded as a future force for them as already discussed before. Thus, AEIs who are the instructors of farmers, should be able to use new information technologies in their offices and, when possible, in courses. More and more the children of farmers (usually the farmers of tomorrow) graduate from high school or university with the enthusiasm of applying these new information technologies, this competency is also needed for AEIs.

3-5-6-7

C. Technical competencies (TC)	Supportive chapters

1. Subject matter understanding: Knowing the content, importance and feasibility of a given topic or discipline being addressed such as animal keeping and breeding, horticulture, carpet knitting, and crop production. AEIs come from many different disciplines, with at least a BSc. Degree in their specialities. However, having only a university degree is not sufficient. Instead, they should be professional, experienced, and aware of the latest developments in their area. They should also feasibly be able to transfer their scientific knowledge in a relevant way to farmers. They could focus on aspects of the subject that would be the most useful to farmers and skip other more complicated and inapplicable content.

2-3-5-7-8

1.1 Knowing about common technical knowledge and skills such as information about sustainable agriculture", and "knowledge of climate changes", "initiation of small cottage industries and manufacturing near the farm", "packaging and food processing of agricultural and animal products", "application of new technologies on the farm" and "soil, its characteristics and sensitivities". It is important that AEIs have this common knowledge in addition to their own specialties or have the knowledge to guide farmers to find answers for these common farming issues.

2-3-4-6

1.1.1 Knowledge and skills regarding the "application of mechanization technology on the farm", "using new irrigation methods", and "initiating intensive farming and greenhouses". Many farmers are willing to try new farming technologies but they are not able to find sufficient information about introducing and implementing these projects. Therefore, the knowledge and experience of AEIs can be of benefit to inform farmers about meeting requirements and obtaining funding from private or governmental contractors in order to carry out these projects.

6

1.1.2 Knowledge and skills of producing crop, domestic animals, fruits and vegetables. Farmers perceived that AEIs need, firstly, to have the knowledge and skills of crop production which is their major agricultural product. Then fruits and vegetables are the next priority. As we saw in chapter five, most of the farmers are multi-product producers and have different products on their farms. So, AEIs need to be able to give general support to farmers in the various aspects of their multi-production farms. Of course, for more detailed themes it is necessary to have consultations with other subject matter specialists.

4-5-6

2. Farmers' business understanding: Familiarity with and understanding various aspects of farming, its characteristics, difficulties, changes and challenges. Therefore, an AEI should be able to empathise with farmers and their circumstances. This is definitely important for an AEI if he/she wants to establish cordial communication with farmers and support them. Farmers usually do not feel relaxed when communicating with extension personnel who look entirely different in terms of appearance, language, culture, and behaviour. Therefore, understanding farmers, their business and life style is assumed as another competency of AEIs, both, in and out of the courses.

2-5-8

9.7.1 Stratification of the competency model based on gender, age, education level and motivation of farmers to attend extension courses

The findings presented herein emphasise the stratification and diversification of a competency profile of AEIs. Therefore the question now is how to synthesise all of this information into an actual competency profile of AEIs. The findings from the farmers' studies showed that AEIs should deal with farmers differently based on their unique characteristics such as gender, age, education level and motivation.

● **Gender:** In general, AEIs who teach female farmers need different competencies to those AEIs who deal primarily with male farmers. The instructors of females are expected to have technical competencies in the types of courses females would prefer to receive. Stratification, therefore, is needed in terms of topics. Females participate in courses that are more linked to their activities in the home or on the farm such as milking animals, knitting, childcare, family health, and cooking. In terms of general competencies, AEIs who deal with females should be aware of the cultural and historical circumstances for women and possess knowledge about gender inequalities amongst farmers. They must have the skills to encourage female participation in courses, which could include making the provision for their children to be present at courses

● **Age:** Several studies have shown that older farmers have more difficulties than younger farmers with their work and, in particular, participation in extension courses. Hence, AEIs who work with older farmers should have the technical competencies to be able to present more practical and simplified techniques and skills. They should be aware of the indigenous (local) knowledge of farmers and have similar working experiences to earn the farmers' trust. Furthermore, they should have a wide knowledge in many agricultural areas. As to their general competencies, AEIs who teach older farmers are expected to be professionals in adult education, instructional technology, and relationship and communication skills. It means that AEIs need high competency levels in these aspects. In addition, in terms of personality, they should be more patient and willing to work with adults. As a matter of experience, older farmers do not trust AEIs who are younger than them therefore there should not be a significant age difference between older farmers and their AEI.

● **Education level:** Again, AEIs who deal with lower educated farmers need to have rather different levels and kinds of competencies. Regarding technical competencies, they are expected to have more practical than theoretical knowledge; the ability to link between local and new knowledge and technologies on the farm, and the competency of focusing on the most essential innovations in the field rather than presenting only complex concepts. In terms of general competencies, they should be sensitive to teaching adults; preferably speaking in the language of farmers. They should have the capability of translating subjects in very simple and understandable ways and be competent with using audio-visual instructional tools rather than only written instruction material.

● **Motivation:** The study of farmers showed that farmers are motivated to attend extension courses depending on their group. Therefore, the kind and the level of competencies AEIs need vary based on the kind of motivation required. According to the findings of Part One, the majority of farmers are motivated by performance and personal development incentives. Consequently, AEIs should be able to explore and subsequently provide the appropriate incentives for each group. For instance, topic innovativeness, and usefulness will motivate a certain group of farmers. Also, participant accommodation, instructional instruments, teaching methods, course location, provision of certificates, and post-course support are all factors that can encourage certain groups of farmers to actively attend courses.

9.8 Guidelines for professional development of AEIs

A competency profile for AEIs can help HRD practitioners to contribute to the professional development of AEIs. Based on this study, and with regard to the abovementioned issues about the stratification of a competency profile of AEIs, various guidelines can be formulated for increasing the effectiveness of AEIs.

● The research presented here showed that AEIs already have moderate levels of skills and knowledge for their role as instructors. Although farmers were more or less pleased with their competencies, it appeared that there was room for improvement. AEIs need to be trained both in terms of the technical and general aspects of their role.

• Regarding technical competencies the focus should be on the most urgent needs of farmers and the most important problems they can be expected to encounter at present and in the future. Likewise, these technical competencies should be linked to appropriate and sustainable technologies taking farmers' limitations and culture into account (sustainable technologies).

• In terms of the professional development of AEIs in their instruction role, they should acquire a mix of general competencies. Specifically these competencies would be "encouraging and stimulating skills", "examination methods", "post-course follow-up" and "instructional technology" (according to chapter five). Additionally, because the majority of current AEIs are subject matter specialists and not extension/education specialists, they need to be supported in all different areas of adult and informal education such as communication, leadership, teaching methods, and class management. Furthermore, the knowledge of AEIs from agricultural development (AD) and agricultural extension services (AES) and the changes and crucial problems of farmers should be enhanced (based on chapter six and seven).

• Overall, it can be concluded that presenting only short-term extension courses for farmers is not enough. It is important that AEIs are stimulated to develop professionally by means of a variety of approaches that can be used to diversify extension courses and provide more opportunities for farmers to learn informally. Consequently, AEIs are asked to broaden the information sources and coping strategies that will be used by farmers in the future (with regard to chapters three and five). So, instead of solely focusing on current extension courses, it is suggested to combine them with informal instruction methods such as far-distance teaching, consulting, personal meetings, and telephone contacts.

• An important question is whether AEIs are capable of acquiring new, more interactive and participatory means of competency-based education. For this it would be very good to have role models with which AEIs can identify. Therefore, it is recommended that some very successful AEIs are selected and rewarded every year and that their experiences are made available for other instructors. Successful instructors would be invited to share their experiences with others during annual or ongoing workshops, seminars and conferences.

• To support this, development is necessary. Demonstration and self-study materials such as instructional brochures, computer soft-ware, video cassettes and CDs about both general and

technical competencies should be provided for AEIs in order to give them the opportunity to independently develop their competencies through diverse written or audio-visual learning tools. They should have access to current and reliable information sources. Hence, the competency development of new and recent knowledge and skills, particularly via new information technology such as the internet, is also required.

● A different issue concerns the gender of the target group of AEIs. The findings of our research showed that female farmers participate in extension programs to a lesser extent and that they have relatively little communication with different individuals, groups or companies in the agro-business sector who are involved in this area. So, AEIs should be very sensitive in dealing with women in extension courses and take their specific concerns into account. They can encourage females to participate more actively in AES programs, particularly in extension courses by providing a convenient environment for them. Course environments should not be contradictory to the beliefs of women and their families. For example, female farmers do not attend courses if they are too far from their homes, if they overlap with their regular housekeeping time, or if the topics of the courses are not of interest to them.

● Another farmer-related issue for AEIs to consider is age and education. It was seen that older, poorly educated and smallholder farmers had more difficulties in coping with changes, enhancing their information and skills, and being communicative and active in their area. Therefore, knowing how to support these three vulnerable groups of farmers is very important for AEIs.

● In reaching the target group, a balance is needed between scientific and practical knowledge. Familiarity of AEIs with farmers' indigenous (local) knowledge and its extraordinary role in the development of farmers is therefore crucial if they are to influence farmers and encourage their active participation in extension courses. Hence, acquaintance with the local knowledge of farmers should be taken into account by AEIs if they are supposed to contribute to the development of farmers' competencies in their careers.

● An important factor of participation in programs, as well as extension courses, is motivation. The results of chapter five showed that farmers participate in courses for different reasons. This finding should play a significant role in designing extension courses for farmers. Consequently,

these reasons should also be taken into account by instructors when inviting farmers to attend courses.

● Finally it is recommended to administer an entrance exam including, both, technical and general competencies for all contracted AEIs every year. Getting a certain score or passing specified training programs must be considered as a criterion and prerequisite for AEIs to start their collaboration with AES.

9.9 Limitations of the study and recommendations for further research

In this section the limitations of the study are described and some recommendations for further research are given. The most important limitations of the research are summarized below:

● This research was conducted in the province of Esfahan, which is representative of the other provinces of Iran (discussed in chapter one). Nevertheless, further research is proposed at the national level in order to achieve broader and more generalisable results. It also affords a comparison of the results of the study with other provinces. This competency modelling research can, additionally, be implemented amongst other HR professionals in agricultural extension.

● Although survey methodology (interview or sending questionnaires) is quite common and widely used for data collection in social sciences, combining this with performance assessment could enhance the added value of this research significantly. Therefore, further research is suggested in which performance assessment of farmers and AEIs is included in order to raise the trustworthiness and applicability of the findings.

● Interviewing farmers appeared to be a major difficulty of the research. Due to dealing with poorly educated farmers, the interviewer had to explain the questions frequently so that farmers could understand the questions. This took more time than expected both from farmers and interviewers. Additionally, at the time of interview most of the farmers were busy with their farming activities and they had very little time to spend on interviews. Furthermore, access to farmers was hard, even after making appointments through their members of rural councils. In further research these issues must be better addressed.

● In the farmer studies, attention was given to those farmers participating in extension training programs. The reason for this selection was the time restriction and also the importance of the views of these farmers in supporting the main objective of the research (developing a competency profile for AEIs). Although, the viewpoints of 27 non-participating farmers were investigated in the pilot study, the questions were not exactly the same. However, it would have been preferable if the opinions of non-participating farmers were also obtained with the same questionnaires in order to compare their views with their participating counterparts. It would have shed light on the correlation of opinions of these two target groups of farmers. Therefore, it is recommended that a sizable group of non-participating farmers will also be included in further research.

● Chapter eight describes the main study of this thesis consisting of 257 questionnaires sent to agricultural experts, managers and AEIs in agricultural organizations of the province of Esfahan. Additionally, gift incentives were included with the questionnaires to encourage participation. Reminders also were sent to respondents one month after sending the questionnaires. Nevertheless, many of the experts did not react to them or sent back uncompleted questionnaires. The total response rate was 67% which is still good but not what was expected.

● In the proposed competency profile (chapter nine) general competencies of AEIs received major attention. But what requires careful attention is that even general competencies of AEIs should vary amongst different groups of farmers. For example, as previously discussed, AEIs who are dealing with females, smallholders, older, poorly educated farmers need different general competencies than instructors who teach mainly male, rich, young, and higher educated farmers. As for technical competencies, although some technical competencies were introduced by respondents and added to part B of table 9.4, still this part does not adequately address the needs of different groups of farmers. One of the points here is the wide diversity of technical areas of AEIs. Nonetheless, it is proposed to have a number of separate competency profiles for AEIs who posses different technical specialties such as animal husbandry, crop sciences, and horticulture. In short, the technical competencies of AEIs can be categorized based on the specialty of AEIs or specific subjects of the course.

● The survey questionnaire of the competency model study (chapter eight) underwent several elaboration rounds with different respondents and only the most relevant items were included in the final questionnaire. Therefore, most items on the lists (competencies, outputs, standards, ethical issues and future forces) received high scores. It was good to have such congruency of opinions from different respondents; notwithstanding, these high scores made prioritising the items rather difficult. In other words, when the differences between scores are not very significant, they cannot be statistically sorted based on their importance. This problem needs to be addressed in further research.

● Now that a competency profile has been developed based on the opinions of farmers, agricultural technical specialists, managers and AEIs, an important question that arises is how to weight the various viewpoints that are not necessarily in line with each other. As it was previously seen, all different ideas about each component of the competency model were mentioned, and an overview was given of which group of respondents supported each item (the second column of the corresponding tables). Therefore, one interpretation would be to prioritise the items that are confirmed by different respondents (chapters) to the items that are only declared by one group of respondents. However, in this study a major limitation is that not all items had been similarly asked from different groups of respondents. Therefore, one cannot assume that an item might not be supported by certain respondents by virtue of the fact that it was not included in their version of the questionnaire. Further research should address this issue in order to have more comparable results in the end.

● Despite all the advantages of the proposed HRD model of McLagan (1989), it contains a number of weaknesses too. One problem of the model is that there are always overlaps between different items of the model; so, one issue can appear in different components of the model repeatedly. For example, "presentation skill" was mentioned in outputs, standards and also competency lists and this might look confusing for readers. Another shortcoming is that the model relies too much on the list of competencies, outputs and other elements instead of on in-depth analysis and interpretive outcomes. Using survey questionnaires and depending only upon the opinions of different respondents could be regarded as another limitation of the model. Obviously, monitoring and evaluating the competencies and performance of the target group can also give many important indications for developing the competency profile but the model does not take it into account. Similarly, the model does not say anything about the way

that all components of the generic competency profile can lead to the performance enhancement phase. We tried to address these weaknesses by integrating other parallel studies and supporting the model with their findings which resulted in more in-depth analysis. However, they must be considered in further research.

9.10 Implications of the model for agricultural extension organization in Esfahan

Agricultural extension organizations in Esfahan can benefit from this proposed competency profile firstly in recruitment and secondly in professional development of AEIs in the future. It is expected that the model will help program planners, managers and extension policy makers at the provincial level to focus on the most important components of the model; expansion of facilities, budget and human workforce in the areas the model has suggested. For instance, they might think about balancing the number of agricultural experts and extension specialists in different townships of the province. They are asked to give more attention to HRM and attempt to eliminate the shortcomings of HRM in the organization, to provide more support for farmers who are older, smallholders, women and poorly educated, to increase the trustworthiness of AES for farmers, to carefully consider ethical issues of the roles of AEIs and other personnel, and to convince them to seriously keep these in mind in their treatment of farmers. Finally competency models would guide the extension policy makers in the province to be aware of the kinds of technical and general competencies which are necessary for their personnel as well as AEIs and should be tailored to the long-term programming in further HRD efforts. They may want to propose these issues to the MAJ for consideration when designing national projects as well. The extension organizations of Esfahan are encouraged to evaluate the current model in practice and elaborate it more by involving the opinions of other stakeholders in agri-business sectors too. For example, inquiring the views of input-sellers and output-buyers, extension agents, and rural youth about a competency profile of AEIs can be a topic in further studies. Also, launching research projects in order to investigate the specific technical competencies needed for various extension personnel, especially AEIs, are recommended.

9.11 Implications of the model for competency theory

As was illustrated earlier in our developed competency model, ethical issues and future forces impact on other elements of the competency model and subsequently outputs and standards influence the roles and competencies of AEIs (figure 9.1). All these impacts indicate the importance of application of competencies towards a successful performance.

Therefore, this research underlines the need for shifting from a behaviouristic approach of competency assessment and development to a more performance-oriented perspective. Our study clearly showed that competencies themselves do not make sense out of their context. By considering other intervening factors such as future forces and ethical issues in the McLagan competency model it provided a systematic strategy and practical approach for this research. However, the findings of this research uncovered the fact that although competency modelling studies can provide effective findings for agricultural extension systems and bring about fruitful guidelines for HRD, there is still a need for the integration of performance assessment studies in such competency modelling surveys. Only accentuating the competencies of HR professionals such as AEIs, based on the opinions of various respondents, is not a composite of the whole; instead, the supervision of individual and group performance could be regarded as another trustworthy strategy for supporting the results. Likewise, the role of informal learning should be investigated in competency assessment studies in the extension field. For farmers, like many other learners, this way of learning is very common; nevertheless, it is not normally gained via participation in extension courses. So, this issue must be somehow included in competency modelling research of the extension area. A recent study of Karbasioun et al. (2005) confirmed this fact and showed that informal farmer learning resulted in notable competency development and thereafter performance enhancement of the targeted farmers.

9.12 Final remarks

This research was intended to initiate competency modelling research in the agricultural extension arena in Iran. AEIs were selected as an important group of HR professionals of the agricultural extension field. Although competency-based education and competency assessment studies have been of interest to different researchers in various fields for many years (e.g. Hill & Houghton, 2001; McEvoy et al., 2005; Ricciardi, 2005; Rothwell, 1996), this was the first experience of applying a HRD competency assessment study in the field of extension services of the Ministry of Agriculture of Iran. In other words, the current research

was a HRD study that was transferred from the business and organizational environment to a non-business and non-organizational environment which could be considered as a new application of HRD in a developing country. Certainly, it was quite unknown, even for the researchers, to what extent this integration was workable and the fit of the innovated model with the target system. It was already evident that this challenge of competency modelling research in the field of extension had already started in many developed countries, the U.S. in particular, and the researchers reviewed a number of publications in this respect to be acquainted with the approaches they took and the outcomes they achieved (e.g. Cooper & Graham, 2001; Liles & Mustian, 2004; McDowell, 2002; Mosher, 1966; Sanders, 1972; Scheer, 2006; Seevers et al., 1997; Shim, 2006; Singletary et al., 2004; Singletary et al., 2006; Van den Ban, 1996).

In order to choose the competency model in this research, as outlined in chapter one, many competency studies, accomplished mainly by American and British researchers, were reviewed and finally, after an exhaustive literature search, the McLagan model (op. cit.), which is a well-known and widely used competency assessment approach, was used and adjusted and examined. Some of the competency modelling studies that were reviewed (general introduction) are the following: The Southern Extension Leadership Development (SELD); National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs); the work of Stone and Bieber (1997); the study of Cooper and Graham (2001); Texas Cooperative Extension Competency Model (2003); Michigan State University Extension Competency Model; North Carolina Cooperative Extension and Ohio State University Extension Competency Models; American Society for Training and Development (ASTD) which was developed by McLagan in the 1980s and also in 2004; and finally a competency model for the Korean extension system (Shim, 2006).

Shim (2006) applied the newest version of the ASTD competency model (2004) in her competency modelling research for the Korean extension system. Nevertheless, the researchers in the current thesis did not apply that version. The reason was that, despite its advantages, it is more business-orientated and focuses on the basic areas of expertise (personal, interpersonal and business/management) that are more tailored to companies and organizations. Therefore, it was considered difficult to apply this model in the field of agricultural extension (Bernthal et al., 2004).

The findings of this research expand the scope of the generic competency profile (including different components such as future forces, ethical issues, etc.) in comparison with the Texas Extension Competency Model, which is mainly focused on specific competencies. However, the categorization of specific competencies in the Texas Model is more detailed because the whole extension system is taken into account (Texas Cooperative Extension, 2003). The competency lists (specific competencies) found in this research are, to a large extent, similar to the core competencies distinguished for exemplary extension educators in Michigan State University (Michigan State University Extension, 2003). Additionally, the competencies described in this research are in line with the seven core competencies that Liles and Mustian (2004) identified in the North Carolina Cooperative Extension (NCCE). Nevertheless, the NCCE competency model addresses the critical competencies of all NCCE employees and volunteers which are more generic. Likewise, the twelve most important competencies identified for the roles of county extension agents and supervisors in Arkansas are mostly concerned with the ethical issues of the role of AEIs in our study (Cooper & Graham, 2001). This fact re-iterates the close relationship between ethical issues and competencies in our research. The competencies listed in the current research are, to some extent, different from the ones Kim (2003) and Shim (2006) categorized in which their focus was more on the '*consultancy*' role of extension agents and workers. Nonetheless, the findings support Shim's conclusion that the basic role of extension professionals is still subject matter specialists. In our research technical competencies also received high importance from different respondents. Shim, similar to this research, stressed the necessity of shifting from traditional extension instruction to more competency-based, participatory and performance oriented approaches. She also emphasized various ethical issues that were achieved in our study and identified them to be crucial for the roles of Korean extension officers. Finally Shim distinguished different roles for Korean extension agents to those described for the roles of AEIs in this research. She did not give heed to future forces within the roles of her target group which might be assumed as one of the shortcomings of her developed model for the agricultural extension system in Korea.

Lastly, statistical analyses of the various studies of farmers in this PhD project clearly showed that it is practically feasible to design a generic competency profile for AEIs; nevertheless, stratification (based on age and educational level, etc.) of farmers must be taken into consideration more rigorously in order to meet the required competencies of AEIs for different groups of farmers. If so, different groups of farmers would receive appropriate supports from

AEIs during, and after, the extension courses. The parallel studies presented in this thesis were all aligned to support and triangulate the selected innovative approach to competency assessment in the field of agricultural extension. Despite the fact that the unification of the two different fields (HRD & agricultural extension) in the Iranian context seemed to be difficult and caused some ambiguities for the researchers themselves, the results of our study showed that it is still possible to have such integration. Of course, this model is just a stepping stone towards more comprehensive models in the future and has not yet been practically tested. Nevertheless, it is readily flexible to be adjusted to the new situations and ongoing changes. Therefore, putting the model into practice and conducting an explicit evaluation afterwards, will determine the extent to which it is fruitful for AEIs. Thereafter, such an evaluation will result in a new tailor-made version of the model. It calls other researchers in agricultural and non-agricultural sectors to implement similar studies and attempt to address the deficits of the current study.

Concluding remarks of part III

In Part III of this thesis the competency profile for AEIs for the next 3-5 years was developed by surveying 257 different groups of agricultural experts as well as technical specialists, managers, and AEIs (chapter eight). The findings were supplemented by the findings of other empirical studies of the dissertation (parts one and two). It was finally concluded that although McLagan's competency model was applicable to the target group, triangulation of the model showed that modifications were needed to arrive at a practical profile for AEIs. Moreover, many complexities make developing such a competency profile difficult and would necessitate stratification according to various sub-groups of AEIs. More importantly, the model needs to be evaluated and re-designed along with emerging new future forces, changes and difficulties in the agricultural extension system of Iran. However, this study, despite its limitations, initiated a new approach of applying a human resource development research methodology in the field of extension in developing countries such as Iran, and encourages other Iranian researchers to pursue this approach and improve the effectiveness of such research for agricultural extension organizations and possibly for even non-agricultural organizations in Iran and other developing countries. Thus, agricultural extension systems in other Middle Eastern countries can most likely benefit from this competency modelling research and it is suggested that similar studies be conducted there.

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Appendices

English summary

It is evident that the world is changing at an ever increasing pace. Consequently, human resource development (HRD) is considered to be extremely important, especially to support change processes. This holds both for individuals and organizations. Organizations are increasingly aware of the fact that HRD plays a crucial role for their success and survival. Hence, many HRD models have been designed and developed to support employees and employers in applying HRD programs, and to contribute to their performance improvement.

In the majority of HRD models, much attention has been paid to competency profiles of employees. It is because of the inevitable function of competencies in performance development. Therefore, this dissertation aims at developing a competency profile for agricultural extension instructors (AEIs). This is the first time that such an HRD competency model is applied for the needs assessment of a group of extension professionals in Iran. So, this research is an initiative and pioneering piece of work in order to apply HRD research methodology for competency profiling in the field of extension in a developing country such as Iran. To do so, many competency models were reviewed and finally the studies of McLagan (1983; 1989) were selected as the basis for the study. Previous research confirms that the different HR professionals in the agri-business sector of Iran have been struggling with many difficulties in their jobs. In particular, AEIs who are originally technical specialists and cooperate with the ministry of agriculture (MAJ) as part-timers, experience various problems in teaching farmers during short-term extension courses.

Designing a competency profile for the next 3-5 years could help HRD experts to appropriately recruit and then improve the competencies of AEIs in order to improve their job performance, and thus agricultural development. Therefore, the current study was planned and implemented in the province of Esfahan, one of the most important and biggest provinces of Iran. In terms of the respondents of the research, in order to triangulate the model and to increase the reliability of the project, different groups of respondents were included; participating as well as non-participating farmers in extension programs, agricultural experts, managers, and AEIs.

This thesis comprises three parts and nine chapters in total. In *Chapter one* a general introduction of the status of HRD in Iran, HRD competency models, competency research,

problem statement, research design, definitions of the concepts of the study, and descriptions of the province of Esfahan are given. Thereafter, seven empirical studies are presented from chapter two to chapter eight in which, Part I of the thesis contains four chapters regarding studies of farmers, part II contains two chapters regarding studies of experts and finally part III focuses on the synthesis of the study which comprises two chapters (HRD competency study and the final version of the model). Below, the different chapters and their findings are summarised.

Part I

Part one is quite important for the project due to the central position of farmers in the competency profile of AEIs and includes chapters two, three, four and five.

Chapter two presents the major results of the pilot study, which was implemented in two townships of the province of Esfahan amongst 27 farmers. The results were categorized and analyzed using qualitative methods and helped the researcher to modify the research tools for performing the sub-sequel studies of farmers. The farmers selected for the pilot study were all non-participants in extension courses and had mainly negative opinions about the role of AES and AEIs in their competency development process. The findings were significantly different from the viewpoints of the target group of the three further farmer studies who were selected from participating farmers. The study revealed that non-participants lack various general and technical competencies on their farms and they were hardly able to cope with the changes which had occurred on their farms in the last decade. They had low contact with both governmental and private extension personnel and were not actively involved in the extension programs conducted by AES in their villages. Generally speaking, they were mostly pessimistic about their future and improving their situation and income. However, they felt that changes should be made and asked for more support from the MAJ and AES in that respect. The results of the pilot study helped the researchers to implement the next three studies of participant farmers (chapter three in particular).

In *chapters three, four and five*, 102 farmers who had already participated in extension courses, from 17 townships of the province of Esfahan were interviewed. The intention was to investigate farmers' information sources, coping strategies, internal and external changes, the institutions or companies which are involved in farmer training programs and the role of AES

and AEIs in competency development of farmers, fruitfulness of extension courses and opinions of farmers about the ideal AEI.

Chapter three is the second farmer-based study. In this chapter the emphasis is on the changes that farmers faced over the last decade and also on their information sources and coping strategies. The results showed that, on average, the participating farmers felt internal and external changes to be positive but at a very slow rate. They had a better impression about internal changes in comparison to external ones. The most important information source and coping strategy was relying on governmental agricultural extension services (AES). Universities and research centres did not play any remarkable role in farmers' information construction. Most of the farmers were generally concerned about the financial support of the ministry of agriculture (MAJ) and particularly the price of agricultural inputs. Inferential statistics from the findings of chapter two displayed that older, smallholder and poorly educated farmers had more difficulty in using information sources and coping with unexpected changes on their farms.

Chapter four aims at exploring the role of AES in supporting farmers. The extent to which AES has already helped farmers and the results that are expected in the future are described. Also, the perception of farmers about the fruitfulness of different AES programs is assessed in this chapter. The findings uncovered that farmers are pleased with the support they have received from AES so far but they stressed more support is needed in the future. In general they were sufficiently informed about AES programs. The results again showed that older and low educated farmers need more support from AES in their farming and they necessitate a tailor-made competency profile for AEIs who are dealing with that specific group of farmers. Many farmers still do not recognize a number of AES programs such as rural councils, constructional army and groups and rural youth clubs. Nevertheless, governmental extension personnel are still assumed to be the main information source of farmers.

Chapter five investigates course experiences of farmers. This chapter is the closest study to the basic objective of the PhD project and gives concrete implications for developing the competency profile of AEIs. The perceptions of farmers about the usefulness of the courses, their quality ratings on different aspects, AEIs and their competencies, the ideal competencies of an AEI, the reasons for course attendance were all examined in this chapter. According to

the results, farmers generally perceived extension courses positively but they thought the courses could be better organized in terms of the duration of the courses, examination methods and availability of instructional methods. Also, they were moderately pleased with the competencies of AEIs but they expected improvement in their examination, follow-up and instructional technology skills. Personal and performance improvement were the most important motives for farmers' participation in extension courses. Whereas external motives, such as getting the certificate after the course, were perceived as the least important incentives for course attendance. Additionally, significant differences were found between different groups of farmers in terms of age, education etc. and their motivation for participation in courses. The results showed that designing a common competency profile for AEIs is possible but variation is needed as to the gender, marital status, learning motives, and age and education level of farmers

Part II

Part two contains two different chapters in which experienced experts were selected and queried to gather the views from these informed professionals. To do so, in this part of the book attention is paid to the perceptions of experts in allusion to "*Agricultural Development*" (AD) and "*Agricultural Extension Services*" (AES) changes, the problems hampering AD and AES evolution over the last decade, the importance of AD and AES problems, their priority in the future, and the extent to which they are solvable by MAJ alone.

The major objective of these two chapters (studies of experts) was to gain a better understanding of the context of AD and AES within the wider framework of the career of AEIs and to see AEIs in a broader scope with all the interactions they have with the whole system. The findings of these two chapters are exhibited below.

Chapter six uncovered that the shortage of adequate funds and the difficulties that MAJ experiences in controlling the beneficiary dealers, influence of political issues on MAJ activities, insufficiency of MAJ international contacts, and distrust of agricultural business for private investors are assumed as major problems of AD both at the present and in the future. In general, experts perceived that the evolution of AD in Iran over the last years was collectively positive but much can be done to make the AD process faster. They expect MAJ to focus on more human-based than technique-based strategies. In their view, MAJ is not able to address the majority of AD problems alone and the cooperation of other involved ministries is also

necessary. They believed that AEIs should expand their roles to other pertinent roles like communicator, networker, mediator, and so on.

Chapter seven revealed that in the viewpoint of experts, AES changes were generally positive but at a very slow rate. They perceived insufficient allocated funds (such as what was said in the previous chapter) and lack of cooperation among AES, research, and education as the two common current and future AES problems. Experts were mainly concerned about HRD and HRM related problems particularly, national and international communications, the power of MAJ to stabilize the price of agricultural inputs, the influence from political forces, shortage of motivation and satisfaction of employees, insufficient support to smallholder farmers, allocating inadequate budget to extension projects and using top-down management strategies. Nevertheless, MAJ has not addressed the majority of problems as it had hoped. They once again noted that AEIs need to play different roles in order to address AES problems such as farmer problem solver, AES change accelerator, AES communicator, and AES program designer.

Part III

Part three, which is the outcome and synthesis of the whole project, includes chapter eight and nine. Chapter eight is the major study of the PhD project or HRD competency profile study and chapter nine offers the implications of other chapters for the competency profile of AEIs in this study.

Chapter eight discusses the competency model of AEIs introduced by McLagan (op cit.). Future forces, ethical issues, outputs, standards, and competencies of AEIs as the essential components of the competency profile are examined in this chapter. This study is the core research of this dissertation and is aimed at the provision of a tailor-made job competency profile for AEIs. In order to do that, the model was adjusted to the AES system in Iran. Then it was translated into the Persian language and finally a closed questionnaire was developed and sent to 257 agricultural experts, managers and AEIs in the province of Esfahan. The results of this chapter alongside with experts' and farmers' studies triangulate the findings in order to design the final version of a competency profile for AEIs in the next chapter. The findings summarily disclosed that in the opinion of respondents most of the surveyed elements of the competency profile were given a high score. In particular, ten future issues, ten ethical issues,

ten competencies and eleven outputs were presented, which were perceived to be highly important for the role of AEIs in the next 3-5 years.

Chapter nine presents the final version of the competency profile of AEIs based on the outcomes of different studies of this PhD project. In this chapter various perspectives of farmers, and HR professionals in the field of agriculture such as AEIs, technical specialists and managers are put together to increase the trustworthiness of the model presented. According to this final competency model, new roles, future issues, ethical issues, outputs and standards are added to the previous version and also clarifications and elaborations of some important elements of the last version are debated. This chapter continues with suggestions for further studies, guidelines for professional development of AEIs and closes with concluding remarks.

Samenvatting

Het is duidelijk dat de wereld in een steeds hoger tempo verandert. Daarom wordt human resource development (HRD) als zeer belangrijk beschouwd, in het bijzonder om veranderingsprocessen te ondersteunen. Dit geldt zowel voor individuen als voor organisaties. Organisaties zijn zich in toenemende mate bewust van het feit dat HRD van wezenlijk belang is voor hun succes. Daarom zijn er vele HRD-modellen ontworpen om werkgevers en werknemers te ondersteunen bij het toepassen van HRD-programma's en bij te dragen aan verbetering van hun prestaties.

In de meeste HRD-modellen wordt veel aandacht besteed aan competentieprofielen van werknemers. Dit is het geval vanwege de cruciale rol van competenties voor prestatieverbetering. Daarom is dit proefschrift gericht op het ontwikkelen van een competentieprofiel voor instructeurs in dienst van de landbouwvoorlichting (zogenaamde Agricultural Extension Instructors of AEI's, in het vervolg van deze samenvatting kortweg aangeduid als 'instructeurs'). Het is de eerste keer dat een dergelijk HRD-competentiemodel wordt gebruikt voor behoefteonderzoek bij een groep van voorlichtingsprofessionals in Iran. Dit onderzoek is dan ook een vernieuwend initiatief om HRD-onderzoeksmethodologie toe te passen op competentieprofilering in de context van voorlichting in een ontwikkelingsland als Iran. Daarom zijn vele competentiemodellen bestudeerd en uiteindelijk zijn de studies van McLagan (1983; 1989) geselecteerd als de basis voor dit onderzoek. Eerder onderzoek bevestigt dat de verschillende HR-professionals in de agri-businesssector in Iran worstelen met vele problemen in hun werk. Vooral genoemde instructeurs, die van oorsprong technisch specialisten zijn en als parttimers samenwerken met het Ministerie van Landbouw (MAJ), ervaren diverse problemen bij het trainen van boeren in kortdurende cursussen.

Het ontwikkelen van een competentieprofiel voor de komende 3 tot 5 jaar zou HRD-experts kunnen helpen om instructeurs te werven en hun competenties te ontwikkelen teneinde hun prestaties te verbeteren en zo ook de ontwikkeling van de landbouw. Het onderzoek is uitgevoerd in de provincie Esfahan, een van de grootste en, wat landbouw betreft, belangrijkste provincies in Iran. Vanwege triangulatie van het de onderzoeksgegevens, en om de betrouwbaarheid van het onderzoek te vergroten, zijn verschillende groepen respondenten

meegenomen: zowel boeren die deelnemen aan voorlichtingsprogramma's als boeren die hieraan niet deelnemen, landbouwexperts, managers en instructeurs.

Dit proefschrift bestaat in totaal uit drie delen en negen hoofdstukken. *Hoofdstuk 1* bevat een algemene introductie van de status van HRD in Iran, HRD-competentiemodellen, competentieonderzoek, probleemstelling, onderzoeksopzet, definities van de concepten in het onderzoek en een beschrijving van de provincie Esfahan. Daarna worden zeven empirische studies gepresenteerd in de hoofdstukken 2 tot en met 8. Deel I van het proefschrift omvat vier hoofdstukken over studies van boeren, deel II bestaat uit twee hoofdstukken over studies van experts en deel III is gericht op een synthese van het onderzoek bestaande uit twee hoofdstukken (een HRD-competentiestudie en de definitieve versie van het model). Hieronder worden de verschillende hoofdstukken en de bijbehorende resultaten samengevat.

Deel I

Deel I is belangrijk voor het onderzoek vanwege de centrale positie die boeren als primaire actoren moeten innemen in het ontwikkelen van het competentieprofiel van de instructeurs, en omvat de hoofdstukken 2, 3, 4 en 5.

In *Hoofdstuk 2* worden de belangrijkste resultaten van de pilotstudie gepresenteerd, die uitgevoerd werd in twee stadsgebieden van de provincie Esfahan onder 27 boeren. De gegevens werden gecategoriseerd en geanalyseerd met behulp van kwalitatieve methoden en de resultaten hielpen de onderzoeker om de onderzoeksinstrumenten aan te passen voor de daaropvolgende studies onder boeren. De boeren die geselecteerd werden voor de pilotstudie hadden allen niet eerder deelgenomen aan cursussen die werden aangeboden door de voorlichtingsdienst en hadden overwegend negatieve opvattingen over de rol van de landbouwvoorlichtingsorganisatie (AES) en instructeurs bij de ontwikkeling van hun competenties. Hun opvattingen weken af van de opvattingen van de doelgroep van de drie andere studies onder boeren (deelnemers aan cursussen). De studie toonde aan dat niet-deelnemende boeren niet beschikten over verschillende algemene en technische competenties op hun boerderij en dat zij nauwelijks in staat waren om te gaan met de veranderingen die hadden plaatsgevonden op hun boerderij in het afgelopen decennium. Ze hadden een beperkt contact met zowel voorlichtingspersoneel van de overheid als privaat voorlichtingspersoneel en waren niet actief betrokken bij de voorlichtingsprogramma's die door de AES werden

uitgevoerd in hun dorpen. Over het algemeen waren zij het meest pessimistisch over hun toekomst en het verbeteren van hun situatie en inkomen. Zij vonden echter dat veranderingen zouden moeten plaatsvinden en vroegen om meer ondersteuning van het MAJ en de AES in dit opzicht. De resultaten van de pilotstudie hielpen de onderzoeker om de volgende drie studies uit te voeren onder boeren die deelnamen aan cursussen (in het bijzonder hoofdstuk 3).

Zoals beschreven in de *hoofdstukken 3, 4 en 5*, werden 102 boeren uit 17 stadsgebieden van de provincie Esfahan die al hadden deelgenomen aan cursussen geïnterviewd. De bedoeling was om de informatiebronnen van boeren, hun copingstrategieën, interne en externe veranderingen, de instituten of bedrijven die betrokken zijn bij trainingsprogramma's voor boeren, de rol van de voorlichtingsdienst en de instructeurs bij de competentieontwikkeling van boeren, opbrengsten van cursussen en opvattingen van boeren over de ideale instructeur te onderzoeken.

Hoofdstuk 3 beschrijft de tweede studie onder boeren. In dit hoofdstuk ligt de nadruk op de veranderingen waarmee de boeren in het afgelopen decennium geconfronteerd werden en op hun informatiebronnen en copingstrategieën. De resultaten lieten zien dat de deelnemende boeren gemiddeld genomen de interne en externe veranderingen als positief maar ook als erg langzaam ervoeren. Zij hadden een betere indruk van de interne veranderingen dan van de externe veranderingen. De meest belangrijke informatiebron en copingstrategie was te vertrouwen op de voorlichtingsorganisatie van de overheid (AES). Universiteiten en onderzoekscentra speelden geen opvallende rol bij de informatieverwerving van de boeren. De meeste boeren waren bezorgd over de financiële ondersteuning door het Ministerie van Landbouw (MAJ) en over de prijs van landbouwgrondstoffen. In het bijzonder oudere boeren, boeren met kleine boerderijen en minder opgeleide boeren hadden meer problemen met het gebruik van informatiebronnen en het omgaan met onverwachte veranderingen op hun boerderij.

Hoofdstuk 4 is gericht op het onderzoeken van de rol van de landbouwvoorlichting bij het ondersteunen van boeren. De mate waarin deze dienst boeren al heeft geholpen en de resultaten die worden verwacht in de toekomst worden beschreven. Ook de perceptie van boeren van de opbrengsten van verschillende voorlichtingsprogramma's wordt nagegaan in dit hoofdstuk. De resultaten toonden aan dat de boeren tevreden waren over de ondersteuning die zij tot nu toe

hadden ontvangen van de voorlichtingsdienst maar zij benadrukten dat in de toekomst meer ondersteuning nodig was. Over het algemeen waren zij voldoende geïnformeerd over de voorlichtingsprogramma's. De resultaten lieten wederom zien dat oudere en minder opgeleide boeren meer ondersteuning van de dienst nodig hadden bij hun werkzaamheden en maken een competentieprofiel op maat noodzakelijk voor instructeurs die te maken hebben met deze specifieke groep boeren. Vele boeren erkenden nog steeds niet het belang van een aantal voorlichtingsprogramma's, zoals plattelandsraden, (leger) bouwgroepen en plattelandsjeugdclubs. Toch werd het voorlichtingspersoneel van de overheid nog steeds beschouwd als de belangrijkste informatiebron van boeren.

Hoofdstuk 5 beschrijft de cursuservaringen van boeren. Dit hoofdstuk sluit direct aan op het primaire doel van dit onderzoeksproject en biedt concrete aanwijzingen voor het ontwikkelen van het competentieprofiel van de instructeurs. De percepties van boeren van de bruikbaarheid van de cursussen, hun kwaliteitsbeoordelingen op verschillende aspecten, instructeurs en hun competenties, de ideale competenties van een instructeur en de redenen voor het bijwonen van een cursus zijn allemaal onderzocht in dit hoofdstuk. De resultaten lieten zien dat de boeren over het algemeen een positieve perceptie van de cursussen hadden maar dat zij dachten dat de cursussen beter georganiseerd konden worden, in termen van cursusduur, beoordelingsmethoden en beschikbaarheid van instructiemethoden. Verder waren zij gematigd tevreden over de competenties van de instructeurs maar verwachtten zij verbetering in hun competenties op het gebied van beoordeling, follow-up en instructietechnologie. Persoonlijke ontwikkeling en prestatieverbetering waren de belangrijkste motieven voor deelname van boeren aan cursussen, terwijl externe motieven, zoals het behalen van het certificaat na de cursus, voor deelname gezien werden als de minst belangrijke. Verder werden er significante verschillen gevonden tussen verschillende groepen boeren zoals ten aanzien van leeftijd, opleiding en hun motivatie voor cursusdeelname. De resultaten toonden aan dat het ontwikkelen van een gemeenschappelijk competentieprofiel voor instructeurs mogelijk is maar dat differentiatie nodig is wat betreft geslacht, burgerlijke staat, leermotieven, leeftijd en opleidingsniveau van de boeren.

Deel II

Deel II bestaat uit twee hoofdstukken. Ervaren experts werden geselecteerd en bevraagd om de opvattingen van deze goed geïnformeerde professionals in kaart te brengen. In dit deel van het

boek wordt aandacht geschonken aan de percepties van experts met betrekking tot landbouwontwikkeling en veranderingen van de landbouwvoorlichtingsorganisatie, de problemen die landbouwontwikkeling en de ontwikkeling van de voorlichtingsorganisatie gedurende het afgelopen decennium gehinderd hebben, het belang van problemen bij landbouwontwikkeling en de voorlichtingsorganisatie, hun prioriteit in de toekomst en de mate waarin deze opgelost kunnen worden door het Ministerie van Landbouw (MAJ) alleen.

Het belangrijkste doel van deze twee hoofdstukken (studies van experts) was om een beter begrip te krijgen van de context van landbouwontwikkeling en de landbouwvoorlichting in het kader van de loopbaan van instructeurs en om dezen te beschouwen in een breder verband met alle interacties die zij hebben met het gehele systeem. De resultaten uit deze twee hoofdstukken worden hieronder weergegeven.

Hoofdstuk 6 illustreert dat het tekort aan geschikte fondsen en de moeilijkheden die het MAJ ondervindt bij het controleren van de begunstigde handelaren, de invloed van politieke kwesties op de activiteiten van het MAJ, het gebrek aan internationale contacten van het MAJ en het gebrek aan vertrouwen van private investeerders in de agri-business gezien werden als belangrijke problemen voor landbouwontwikkeling, zowel nu als in de toekomst. Over het algemeen zagen de experts de landbouwontwikkeling in Iran gedurende de laatste jaren als positief maar er kan veel worden gedaan om het proces van landbouwontwikkeling te versnellen. Zij verwachtten dat het MAJ zich meer zal gaan richten op mensgerichte dan op techniekgerichte strategieën. Naar hun mening is het MAJ niet in staat om het merendeel van de problemen bij de landbouwontwikkeling alleen op te lossen en is samenwerking met andere betrokken ministeries noodzakelijk. Zij geloofden dat de instructeurs hun rollen zouden moeten uitbreiden naar andere van toepassing zijnde rollen zoals voorlichter, netwerker en bemiddelaar.

Hoofdstuk 7 laat zien dat in de ogen van de experts de veranderingen van de voorlichtingsorganisatie over het algemeen positief waren maar dat deze zich in een erg laag tempo voltrokken. Zij zagen onvoldoende toegewezen fondsen (zie ook het voorgaande hoofdstuk) en het gebrek aan samenwerking tussen de voorlichtingsorganisatie, het onderzoek en het onderwijs als de twee meest voorkomende huidige en toekomstige problemen van de voorlichtingsorganisatie. De experts waren hoofdzakelijk bezorgd over HRD- en HRM-gerelateerde problemen, nationale en internationale communicatie, de macht van het MAJ om

de prijs van landbouwgrondstoffen te stabiliseren, de invloed van politieke krachten, het gebrek aan motivatie en tevredenheid van werknemers, onvoldoende ondersteuning voor kleine boeren, het toewijzen van onvoldoende budget aan voorlichtingsprojecten en het gebruik van top-down managementstrategieën. Toch heeft het MAJ het merendeel van de problemen niet opgelost zoals het had gehoopt. Zij merkten wederom op dat instructeurs verschillende rollen dienen te vervullen om de problemen van de voorlichtingsorganisatie op te lossen zoals oplosser van de problemen van boeren, versneller van veranderingen van de voorlichtingsorganisatie, voorlichter en ontwikkelaar van voorlichtingsprogramma's.

Deel III

Deel III betreft de uitkomsten en synthese van het gehele project en omvat de hoofdstukken 8 en 9. Hoofdstuk 8 is de belangrijkste studie van het project oftewel de HRD-competentieprofielstudie en hoofdstuk 9 beschrijft de implicaties van de andere hoofdstukken voor het competentieprofiel van de instructeurs in deze studie.

Hoofdstuk 8 bespreekt het competentiemodel van de instructeurs zoals geïntroduceerd door McLagen (op cit.). Toekomstontwikkelingen, ethische aspecten van het werk, en producten en diensten, standaarden daarvan en competenties van instructeurs, als zijnde de essentiële componenten van het competentieprofiel, worden in dit hoofdstuk onderzocht. Deze studie vormt de kern van het gehele project en is gericht op de ontwikkeling van een maatgericht competentieprofiel voor de instructeurs. Om dit te realiseren, werd het model aangepast aan het landbouwvoorlichtingsysteem in Iran. Vervolgens werd het model vertaald in de Perzische taal en werd een gesloten vragenlijst ontwikkeld en verzonden naar 257 landbouwexperts, managers en instructeurs in de provincie Esfahan. Triangulatie van de resultaten uit dit hoofdstuk en de resultaten van de studies onder boeren en experts leidde tot de ontwikkeling van de definitieve versie van het competentieprofiel voor instructeurs die in het volgende hoofdstuk wordt beschreven. Samengevat lieten de resultaten zien dat naar de mening van de respondenten de meeste van de opgenomen elementen in het competentieprofiel een hoge score verdienden. Met name tien toekomstontwikkelingen, tien ethische aspecten van het werk, tien competenties en elf uitkomsten (producten en diensten) werden gezien als zeer belangrijk voor de rol van de instructeurs in de komende 3 tot 5 jaar.

In *Hoofdstuk 9* wordt de definitieve versie van het competentieprofiel voor de instructeurs gepresenteerd, gebaseerd op de uitkomsten van de verschillende studies van dit onderzoeksproject. In dit hoofdstuk worden verschillende perspectieven van boeren en HR-professionals op het terrein van landbouw (instructeurs, technisch specialisten en managers) gecombineerd om de betrouwbaarheid van het gepresenteerde model te vergroten. In dit definitieve competentiemodel worden nieuwe rollen, toekomstontwikkelingen, ethische aspecten van het werk, uitkomsten en standaarden toegevoegd aan de vorige versie en worden verduidelijkingen en uitwerkingen van enkele belangrijke elementen van de definitieve versie besproken. Het hoofdstuk wordt vervolgd met suggesties voor verder onderzoek en richtlijnen voor professionele ontwikkeling van de instructeurs en wordt afgerond met het trekken van verdere conclusies.

About the author

Mostafa Karbasioun (the author) was born on July 16, 1967 in Esfahan, Iran. He received his diploma from the high school in biological science in Harati School in Esfahan in 1985. After graduation from high school he entered Shiraz University in Shiraz (the centre of the province of Fars), Iran to complete his BSc. He achieved his bachelors' degree in the field of plant protection with the additional title of general agricultural engineering from Shiraz University in December 1990. After graduation he decided to change his major to agricultural extension and education at Masters' level because of his personal interest in the social sciences and their application in the agricultural area. Therefore, he took part in the entrance university exam competition and was accepted to start his Master of Science in the same year (1990) at Tarbiat Modarres University of Tehran (capital of Iran) in agricultural extension and education. This he completed in 1993 with an average degree of 18 out of 20. He was selected as an excellent student among other students in his group. After completing his MSc, he was employed in the Ministry of Jihad-e-Sazandegi, the main Ministry of agriculture in Iran at that time. He worked in the extension organization of the Jiahad-esazandegi organization in Esfahan for two years (until 1995) and at the same time was recruited to Sahrekord University as a part time member of the teaching staff to present agricultural extension and rural development courses to the students at bachelors' level. In 1995 he moved to Sahrekord University and became a permanent staff member of that university. Finally he gained a scholarship from the Ministry of science, research and technology (MSRT) in 2002 and came to Wageningen University to carry out his PhD within the Education and Competence Studies (ECS) group. After graduation, he will continue his cooperation with the ECS group for six months and then will return to Iran and start teaching and also doing research at the University.

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List of publications (2004-2007)

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Karbasioun, M., Mirzaei, S. & Mulder, M. (2005). Informal technical and vocational training programs (ITVTP) and farming in the province of Isfahan, Iran. *Journal of International Agricultural and Extension Education*, *12*, 2, 33-43.

Karbasioun, M., Mulder, M. & Biemans, H. (2007). Changes in Farming, Information sources, and coping strategies of farmers, implications for the competency profile of extension instructors, Esfahan, Iran. *Journal of Agricultural Education and Extension*. Submitted for publication.

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Karbasioun, M., Mulder, M. & Biemans, H. (2007). Agricultural Development Changes and Problems: the Implications for Competency Profile of Agricultural Extension Instructors, Esfahan, Iran, a Survey of Views of Experts. *Journal of Agricultural Systems*. To be submitted for publication.

Karbasioun, M., Mulder, M. & Biemans, H. (2007). Changes in agricultural extension, Problems, and Organizations Involved in Training of Farmers: the Implications for Competency Profile of Agricultural Extension Instructors, Esfahan, Iran*. Journal of Agricultural Education*. To be Submitted for publication.

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Karbasioun, M. & Mulder, M. (2004). HRM and HRD in agricultural extension organisations in Iran, A Literature Review, *Association for International Agricultural Extension Education (AIAEE), Proceeding of 20th Annual Conference*, Dublin, Irland, May 2004,13-24.

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Karbasioun, M., Mirzaey, S. & Mulder, M. (2005). Informal Technical and Vocational Training Programs (ITVTP) and farming in the province of Isfahan, Iran, *Association for International Agricultural Extension Education (AIAEE), Proceeding of 21st Annual Conference, San Antonio, Texas, US.*

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Karbasioun, M. & Chizari, M. (2005). The attitude of agricultural extension instructors regarding their own competencies in the teaching process during short-term courses for farmers, Isfahan, Iran, *Association for International Agricultural Extension Education (AIAEE), Proceedings of 21th Annual Conference, San Antonio, Texas,US.* (Selected as the second outstanding carrousel paper of the conference)

Training and Supervision Plan (TSP)	Mansholt Graduate School	
Name: Mostafa Karbasioun **Group:** Chair group of Education and Competence Studies Group, WUR **Period of PhD study:** October 2002- April 2007		
	Year	**CP**♣
1. General PhD Courses		
Techniques for Writing and Presenting a Scientific Paper (MGS course)	2002	1
Research Methodology (MGS course)	2003	2
Written English (CENTA course)	2003	1
Computerized Data Collection with Author ware (MGS course)	2003	0.5
Subtotal		**4.5**
2. Mansholt-specific Courses		
Mansholt Introduction course (MGS course)	2003	1
Mansholt Multidisciplinary Seminar (PhD day)	2006	1
presentations at scientific (international) conferences		2
20th Annual Conference of Association for International Agricultural Extension Education (AIAEE), Dublin, Ireland	2003	-
21st Annual Conference of Association for International Agricultural Extension Education (AIAEE), San Antonio, Texas.	2005	-
17th European seminar on Extension Education, Izmir, Turkey.	2005	-
7th International Conference on HRD Research and Practice across Europe, Tilburg, The Netherlands.	2005	-
Subtotal		**4**
3. Discipline-specific courses		
Writing research proposal from scratch	2003	3
Master class Media and Methods in Interuniversity research centre for educational research (ICO)	2004	2.5
ICO introductory Course	2004	5
Media and Mediators, messages and means (WGS course)	2004	.7
ICO summer School established in Nicosia, Cyprus	2005	2.5
Subtotal		**13.7**
Total		**22.2**

♣ cp= credit point; 1 cp = a study load of approximately 40 hours (1 week)

فصل هشتم طراحی اولیه نمایه صلاحیتهای شغلی مربیان روستایی استان اصفهان که بر گرفتــه از مدل مک لیگن می باشد را نمایش می دهد. در این فصل عواملی مانند الزامات آینده[1]، موارد اخلاقی[2]، برون دادها[3]، استانداردها[4] و صلاحیتهای شغلی[5] مربیان روستایی بعنوان عناصر اصلی نمایه صلاحیتهای شغلی مربیان روستایی مورد بررسی قرار می گیرند. همانطور که گفته شد این فصل در پی ارائه یک نمایه متناسب و در خور صلاحیتهای شغلی برای مربیان روستایی می باشد. برای این منظور مدل انتخابی با سیستم ترویج روستایی در ایران سازگار گردیده و به زبان فارسی ترجمه شد. در پایان، یک پرسشنامه بسته طراحی گردید و به آدرس محل کار 257 نفر از کارشناسان کشاورزی، مدیران، و مربیان روستایی در سراسر شهرستانهای استان اصفهان ارسال گردید. نتایج این فصل بهمراه نتایج تحقیق کشاورزان و کارشناسان (فصول قبلی) در فصل نهم با هم ادغام شده و نسخه نهایی نمایه یا نیمرخ صلاحیتهای شغلی مربیان روستایی استان اصفهان را بدست داد. یافته های فصل هشتم نشان می دهند که پاسخگویان به اکثر عوامل نمایه صلاحیتهای شغلی مربیان روستایی امتیاز بالایی داده و آنها را مهم برآورد کردند. بطور دقیقتر تعداد ده الزام آینده، ده مورد اخلاقی، ده صلاحیت شغلی و یازده برون داد که در سه تا پنج سال آینده بیشترین اهمیت و اولویت را دارا می باشند، توسط پاسخگویان انتخاب گردیدند.

فصل نهم نسخه نهایی[6] نمایه صلاحیتهای شغلی مربیان روستایی را در استان اصفهان ارائه می کند. در این فصل نظرات کلیه پاسخگویان در فصلهای قبلی (کشاورزان، کارشناسان، مدیران سازمانی و مربیان روستایی) دخالت داده می شوند تا مدل نهایی از قابلیت اعتماد و اعتبار کافی بر خوردار گردد. در فصل نهم با توجه به سایر فصول، الزامات آینده، موارد اخلاقی، برون دادها، استانداردها و صلاحیتهای شغلی جدیدی به مدل پیشنهادی اضافه می شوند و همینطور برخی از عناصر و متغیرها مورد موشکافی و بررسی دقیقتر واقع می شوند و توضیحات کاربردی به آنان اضافه می شود. این فصل با توصیه هایی برای تحقیقات آینده و رهنمودهایی برای توسعه شغلی مربیان روستایی ادامه یافته و بالا خره با نتیجه گیری و پیشنهادات پایان می پذیرد.

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[1] Future forces
[2] Ethical issues
[3] Outputs
[4] Standards
[5] Competencies
[6] Final version

پاسخگویان عمدتا نسبت به مسایل ذیل ابراز نگرانی کردند و بهبود آنها را برای تسهیل روند توسعه خدمات ترویج کشاورزی ضروری اعلام نمودند:

مشکلات مربوط به مدیریت و توسعه منابع انسانی، عدم ارتباطات کافی سازمان ترویج کشاورزی با دیگر سازمانهای دولتی و غیر دولتی چه در سطح ملی و یا بین المللی، عدم قدرت کافی وزارت جهاد کشاورزی درتثبیت قیمت نهاده های کشاورزی، تأثیر پذیری زیاد خدمات ترویج کشاورزی از فشارها و عوامل سیاسی کشور، کمبود انگیزه و رضایت شغلی پرسنل سازمان ترویج کشاورزی، حمایت ناکافی از کشاورزان خرده پا، عدم تخصیص بودجه کافی به پروژه های ترویجی و بالاخره استفاده از استراتژیهای مدیریتی آمرانه یا بالا به پایین. از نظر آنان، جهاد کشاورزی بتنهایی قادر به حل بسیاری از مسایل ذکر شده نبوده است. کارشناسان همانند فصل قبل نقشهای جدیدی را برای مربیان روستایی لازم دانستند تا موفق به تسهیل روند توسعه خدمات ترویج کشاورزی بشوند؛ نقشهایی چون حلال مشکلات کشاورزان[1]، رابط ترویجی[2] و طراح برنامه های ترویجی[3] در این میان مورد تا کید قرار گرفتند.

بخش سوم (سنتز):

بخش سوم که سنتز و نتیجه کل این رساله می باشد، خود شامل فصلهای هشت و نه می باشد. فصل هشتم مطالعه اصلی این پروژه بحساب می آید که مدل مک لیگن را در خصوص نقش مربیگری روستایی مورد آزمایش قرار داده است. فصل نُه که آخرین فصل این کتاب است، یافته های دیگر فصلها در رابطه با طراحی نمایه صلاحیتهای شغلی مربیان روستایی ارائه کرده و نتایج فصل هشتم را بر اساس این یافته ها مورد تحلیل قرار می دهد و در حقیقت نسخه نهایی مدل تلقی می گردد.

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[1] Farmers' problem solver
[2] Extension communicator
[3] Extension program designer

طول دهه گذشته، مسائلی که بعنوان موانع توسعه و تکامل در این دو بخش عمل کرده اند، میزان اهمیت این مسائل در حال حاضرودر آینده، و اینکه تا چه حد این مسائل توسط وزارت جهاد کشاورزی به تنهایی قابل حل هستند، مورد تجزیه و تحلیل قرار گرفت. هدف اساسی دو فصل نامبرده آنستکه درک وسیعتری از محیط و زمینه فعالیت مربیان روستایی بدست دهد و نقش مربیان را در کل سیستم از یک چشم انداز وسیعتری مورد ملاحظه قرار دهد و همچنین عوامل تسهیل کننده و کند کننده فعالیت آنها را بطور روشنتری بررسی نماید. در ذیل، یافته های دو فصل ششم و هفتم مختصراً بیان می گردد.

فصل ششم آشکار نمود که از نقطه نظر کارشناسان پاسخگو مهمترین مسائل و مشکلات توسعه کشاورزی ایران در حال حاضر و آینده عبارتند از: کمبود اعتبار تخصیص داده شده به بخش کشاورزی، مشکل کنترل دلالان و واسطه های سودجو در بخش کشاورزی توسط وزارت جهاد کشاورزی، تأثیر زیاد امور سیاسی بر فعالیتهای جهاد کشاورزی و انتصابات پرسنل، ناکافی بودن ارتباطات بین المللی وزارت جهاد کشاورزی و عدم اعتماد بخش خصوصی برای سرمایه گذاری در بخش کشاورزی. کارشناسان، توسعه کشاورزی در ایران را در طول دهه گذشته روی هم رفته مثبت ارزیابی نمودند ولی بر این باور بودند که روند توسعه بسیار بطئی بوده و نیاز به تسریع در این روند الزامی است. کارشناسان همچنین عقیده داشتند که جهاد کشاورزی می بایستی بجای تمرکز زیاد بر استراتژی های تکنولوژی مدار بر استراتژی های انسان مدارانه تأکـــــید نماید. از نظر آنان نباید انتظار داشت که جهاد کشاورزی رأساً و بتنهایی قادر به حل کلیه مسایل مطروحه باشد؛ بلکه برای حل اکثر مسایل، همکاری و مساعدت دیگر وزارتخانه ها و سازما نها کا ملا ضروری می با شد. در پایان پاسخگویان معتقد بودند که مربیان روستایی برای تسهیل روند توسعه کشاورزی باید نقشهای دیگری بغیر از نقش آموزشگری ازجمله نقشهایی مثل رابط میان کشاورز و وزارت جهاد کشاورزی را ایفا نمایند.

درفصل هفتم همانند فصل ششم، کارشناسان پاسخگو تغییرات خدمات ترویج کشاورزی را روی همرفته مثبت ولی با نرخ بسیار آهسته برآورد کردند. آنها دو مشکل اصلی توسعه خدمات ترویج کشاورزی را در حال حاضر و همچنین در آینده عبارت از کمبود اعتبارات تخصیص داده شده به سازمان ترویج کشاورزی و عدم همکاری و ارتباط کافی بخش تحقیق، ترویج و آموزش دانستند.

در دوره های ترویجی در خصوص سود مندی دوره های آموزشی ترویجی، کیفیت این دوره ها از جهات مختلف، مربیان روستایی و صلاحیت های آموزشی آنان، صلاحیتهای ایده آل ولازم برای یک مربی موفق روستایی و بالاخره انگیزه های شرکت کشاورزان در دوره های ترویجی مطالعه گردید. بر اساس نتایج بدست آمده، کشاورزان، دوره های ترویجی را بطور کلی مثبت ارزیابی می کنند. در عین حال به تصور آنها طول دوره ها، روشهای ارزشیابی، و دسترسی به وسایل مختلف آموزشی و کمک آموزشی از جمله فاکتورهایی است که نیاز به باز نگری و بهبود دارند. همینطور، پاسخگویان عمدتا نظرمثبتی به کآرایی مربیان روستایی داشتند ولی معتقد بودند که مربیان نیاز دارند که صلاحیتهای خود را در زمینه "ارزشیابی از فراگیران"[1]، پیگیری[2] دوره های آموزشی و کاربرد تکنولوژی آموزشی[3] در کلاسها ارتقاء دهند. بهبود عملکرد[4] و رشد شخصی[5] مهمترین انگیزه های شرکت در دوره های ترویجی بود؛ درحالیکه انگیزه های بیرونی[6] نظیر اخذ مدرک در پایان دوره از کمترین اهمیت در نظر کشاورزان برخوردار بودند. علاوه بر این تفاوت معنی داری میان انگیزه های شرکت در دوره ها در گروه های مختلف سنی، جنسی، تحصیلاتی و غیره مشاهده گردید. یافته های تحقیق نشان داد که طراحی یک نمایه کلی برای صلاحیتهای شغلی مربیان روستایی امکان پذیر می باشد ولی در عین حال گروه بندی[7] مقتضی بر اساس جنسیت، تأهل، انگیزه های یادگیری، سن و سطح تحصیلات کشاورزان مخاطب الزامی می باشد.

بخش دوم (مطالعات کارشناسان):

بخش دوم کتاب در بر گیرندۀ دو فصل مختلف می باشد. در این دو فصل تعداد۱۳۰ نفراز کارشناسان مطلع و با تجربه سازمان جهاد کشاورزی استان اصفهان انتخاب گردیده و مورد نظر سنجی قرار گرفتند. برای اینکار، دیدگاه های کارشناسان خبرۀ فوق در مورد میزان تغییرات در روند توسعه کشاورزی و خدمات ترویـــــج در

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[1] Evaluation of learners
[2] Follow-up
[3] Instructional technology
[4] Performance improvement
[5] Personal improvement
[6] External motives
[7] Stratification

همچنین آنان تغییرات درون مزرعه ای را مثبت تر از بیرون مزرعه ای بر آورد نمودند. این بدان معنی است که آنها بهتر توانسته اند تغییراتی را که خودشان مستقیما بر روی آنها کنترل داشته اند، مدیریت کرده و بهبود بخشند.از نظر کشاورزان سازمان ترویج کشاورزی مهمترین منبع اطلاعاتی و استراتژی تطبیق برای پاسخگویان تلقی می گردد. در نقطه مقابل، دانشگاه ها و مراکز تحقیقاتی از نظر کشاورزان نقش بسیار کم رنگ و ضعیفی در این خصوص ایفا می کنند. بسیاری از کشاورزان رضایت چندانی از حمایتهای مالی وزارت جهاد کشاورزی و قیمت نهاده های کشاورزی نداشتند. آمار استنباطی داده های تحقیق روشن کرد که کشاورزان مسن تر، خرده پا و کم سواد مشکلات افزونتری در دسترسی به منابع اطلاعاتی و بکار گیری استراتژیهای مختلف تطبیق در کار کشاورزی خود داشته اند.

فصل چهارم نقش سازمان ترویج کشاورزی را در حمایت از کشاورزان در دهه گذشته ارزیابی می کند. میزان حمایتهایی که تا بحال بعمل آورده و همچنین حمایتهایی که کشاورزان انتظار دارند در آینده بعمل آورد. علاوه بر آن نظر کشاورزان در خصوص میزان سودمندی بر نامه های مختلف ترویج کشاورزی در فصل چهار بررسی می گردد. با توجه به یافته های تحقیق، کشاورزان بطور کلی از حمایتهای سازمان ترویج رضایت دارند ولی بر نیاز به حمایتهای بیشتر در آینده تکیه می کنند. آنها اعلام نمودند که بنحو مطلوبی از برنامه های ترویجی با خبر شده اند. این مطالعه هم نشان داد که کشاورزان مسن و کم سواد نیاز بیشتری به حمایتهای سازمان ترویج کشاورزی دارند. موضوع فوق می بایستی درطراحی نمایه صلاحیتهای شغلی مربیان روستایی که با این دو گروه حسّاسترکشاورزان ارتباط بیشتری دارند، مدّ نظر قرار گیرد. با کمال تعجب بسیاری از کشاورزان از برخی بر نامه های ترویجی مثل شوراهای روستایی، گروهها و سربازان سازندگی و باشگاههای جوانان روستایی اطلاع چندانی نداشتند. با این وجود کارکنان سازمان ترویج جهاد کشاورزی همچنان بعنوان منبع اصلی اطلاعاتی برای اکثریت کشاورزان محسوب می شوند.

فصل پنجم در صدد سنجش تجربه و نقطه نظرات کشاورزان در خصوص دوره های ترویجی است. این فصل از پایان نامه بیشترین نزدیکی را با هدف اصلی تحقیق دارد و دلالتهای قابل توجَهی برای طراحی نمایه صلاحیتهای شغل مربیان روستایی دارد. بطور دقیـــتر در این فصل دیدگاه کشــاورزان شرکت کننـــده

فصل دوم نتایج اصلی مطالعه آزمایشی [1] را ارائه می کند که در دو شهرستان اصفهان و شهرضا انجام گردید و جمعاً ۲۷ کشاورز را تحت پوشش قرار داد. نتایج تحقیق به روش کیفی مورد تجزیه و تحلیل قرار گرفت و به محقق کمک نمود تا وسایل تحقیق را برای انجام مطالعات اصلی کشاورزان به نحو مقتضی فراهم و اصلاح نماید. کشاورزانی که در این مطالعه انتخاب شدند در هیچ دوره ترویجی در سالهای اخیر شرکت نکرده بودند و عمدتاً نظرشان در مورد نقش ترویج کشاورزی و مربیان روستایی منفی بود. این یافته ها با نتایج مطالعات بعدی که کشاورزان که پاسخگویانشان کشاورزان شرکت کننده در دوره های ترویجی بودند، اختلاف کاملاً معنی داری داشت. مطالعه فوق نشان داد که کشاورزان غیر شرکت کننده صلاحیت های شغلی و فنی زیادی را در انجام فعالیتهای کشاورزی در مزرعه خود فاقد هستند. آنها به سختی قادر بوده اند خود را با تغییراتی که در طول دهه گذشته در مزرعه و حیطه کاری آنها رخ داده است، تطبیق دهند. کشاورزان مربوطه ارتباط بسیار اندکی را با پرسنل دولتی یا غیر دولتی ترویجی بـر قـرار کـرده و مشارکت بسیار کمی در برنامه های ترویجی ارائه شده توسط سازمان ترویج داشته اند. در یک کلام، پاسخگویان این مطالعه نسبت به آینده و بهبود اوضاع خود بسیار بد بین و نا امید بودند. علیرغم آن، آنها خود باور داشتند که نیاز به تغییر الزامی است و لذا از وزارت جهاد کشاورزی انتظار حمایتهای جدی برای رفع مشکلات خود را داشتند.

در فصلهای سوم، چهارم و پنجم بر خلاف فصل دوم، جامعه آماری بزرگتر مرکب از ۱۰۲ نفر از کشاورزان شرکت کننده در دوره های آموزشی از ۷ شهرستان استان اصفهان برای مطالعه انتخاب گردیدند وپرسشنامه های تحقیق توسط مصاحبه گران آموزش دیده در محل مزرعه یا منزل کشاورزان تکمیل گردید.

فصل سوم این کتاب شامل دومین مطالعه کشاورزان می باشد. در این تحقیق تأکید بر آندسته از تغییراتی که کشاورزان در طول دهه گذشته با آنها بر خورد کرده اند و همچنین بر منابع اطلاعاتی [2] و استراتژیهای تطبیق [3] آنان در جریان فعالیت کشاورزی خود می باشد. بر اساس یافته های این مطالعه کشاورزان مخاطب معتقد بودند که تغییرات درونی و بیرونی مزرعه آنان در دهه گذشته روی هم رفته مثبت بوده ولی این روند مثبت یک نرخ بسیار کند و بطئی داشته است.

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[1] Pilot study
[2] Information sources
[3] Coping strategies

طراحی نمایه صلاحیتهای شغلی آموزشگران یا مربیان روستایی به سیاستگذاران و مسولان مربوطه کمک شایانی می‌کند تا بهترین مربیان را استخدام نموده و در جهت ارتقای شغلی و بالطبع عملکرد آنان تلاش نمایند. تحقیق حاضر جهت اجرا در استان اصفهان یکی از بزرگترین و مهمترین استانهای کشور بعد از تهران طراحی گردید. برای اینکه مدل را چند بعدی نموده و اعتبار آن را افزایش دهیم، گروه های متفاوتی از پاسخگویان در این تحقیق مورد مطالعه قرار گرفتند. این گروهها شامل کشاورزان شرکت کننده و غیر شرکت کننده در دوره های ترویجی، کارشناسان موضوعی کشاورزی، مدیران کشاورزی و با لاخره مربیان روستایی بودند.

این رساله دکتری شامل **سه بخش اصلی و نه فصل** می باشد. در **فصل اول** یک مقدمه کلی از وضعیت

توسعه منابع انسانی در ایران ، مدلهای صلاحیتهای شغلی، تحقیقات مربوطه، بیان مسئله، طرح تحقیق، تعریف مفاهیم کاربردی در تحقیق، و توضیحاتی در مورد استان اصفهان و ویژگیهای اقلیمی و کشاورزی آن ارائه می شود. بعد از آن از فصل دو تا هشت، جمعاً هفت مطالعه میدانی مختلف بیان می گردند. در بخش اول کتاب چهار فصل (فصلهای دو تا پنج) قرار گرفته است که شامل مطالعات انجام شده بر روی کشاورزان می باشد. بخش دوم در بر گیرنده دو فصل مطالعات کارشناسان کشاورزی می باشد (فصلهای شش و هفت) و بالاخره بخش سوم که سنتز و نتیجه گیری تحقیق است خود شامل دو فصل جداگانه هشت و نه است. فصل هشت مطالعه اصلی تحقیق و بر گرفته از مدل مک لیگن است و بالا خره فصل نهم آخرین و کاملترین نسخه مدل پیشنهادی را ارائه میکند. در زیر بطور خلاصه فصلهای مختلف و نتایج آنها ارائه می گردد.

بخش اول (مطالعات کشاورزان):

این بخش از اهمیت زیادی برخوردار است چراکه کشاورزان درطراحی نمایه صلاحیتهای شغلی مربیان روستایی از جایگاه ویژه ای برخوردار بوده و اصلی ترین گروه مخاطب آنان بحساب می آیند. بخش اول شامل فصلهای دو، سه، چهار و پنج می باشد که هرکدام در ذیل به اختصار بیان می گردند.

خلاصه فارسی:

امروزه جهان بیش از هر زمان دیگر دستخوش تغییرات است و این تغییرات بسرعت در حال افزایش می با شد. ازینرو توسعه منابع انسانی[1] مورد توجه بسیاری از محققان قرار گرفته تا این پروسه تغییر را بنحو شایسته ای هدایت نمایند. موضوع مذکور هم به اشخاص و هم به سازمانها مربوط می شود؛ بسیاری از سازمانها و موسسات هر چه بیشتر از نقش و تاثیر توسعه منابع انسانی آگاه گردیده اند و این امر باعث شده تا محققان زیادی در حیطه فوق فعال شده و مدلهای مختلفی را ارائه نموده اند. هدف این محققان آن بوده که موسسات و کارکنانشان را در بکار بستن برنامه های توسعه منابع انسانی حمایت و تقویت کنند و عملکرد[2] نیروی انسانی رادر سازمانها تا حد امکان ارتقاء دهند. در بسیاری از مدلهای توسعه منابع انسانی، توجه زیادی به طراحی و توسعه نمایه (نیمرخ) صلاحیتهای شغلی[3] کار کنان شده است. چرا که صلاحیتهای مربوطه نقش بسیار چشمگیری در توسعه شغلی و عملکرد کارکنان در سازمانها دارد.

با ذکر این مقدمه، رساله دکترای حاضر در نظر دارد تا نمایه صلاحیتهای شغلی مربیان روستایی ترویج کشاورزی استان اصفهان را در سه تا پنج سال آینده طراحی و پیش بینی نما ید. این برای اولین بار است که یک چنین مدلی برای ارزیابی گروهی از کارشناسان فعال در بخش ترویج کشاورزی ایران مورد استفاده قرار می گیرد. لذا تحقیق حاضر می تواند بعنوان حرکتی نو در جهت کاربرد توسعه منابع انسانی در حیطه ترویج و آموزش کشاورزی تلقی گردد. به این منظور، مدلهای مختلفی که در دیگر کشورها ارائه شده و بکار رفته است، بدقت مورد بررسی قرار گرفت و در پایان مطالعات مک لیگن[4] (۱۹۸۳و ۱۹۸۹) بعنوان محور اصلی تحقیق انتخاب گردید. با مروری بر مطالعات انجام شده روشن گردید که متخصصان توسعه منابع انسانی در بخش کشاورزی ایران با مشکلات و مسائل متنابهی در شغل خود دست به گریبان می باشند. بویژه مربیان روستایی که عمدتاَ متخصصان موضوعی شاغل در وزارت جهاد کشاورزی می باشند و بصورت پاره وقت در امر مربیگری نیز با مدیریت ترویج کشاورزی همکاری می نمایند، مشکلات عدیده ای را در جریان تدریس در دوره های آموزش کشاورزان تجربه می کنند.

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[1] Human resource development (HRD)
[2] Performance
[3] Competency profile
[4] McLagan

تقـدیم بـه :

همـسر عزیـزم مـریم،

پسـر دلبنـدم علیـرضا،

پـدر و مـادر عزیــز و بزرگـوارم،

مربیــان دلسوز و پر تـوان روستـایی،

و

کلیه کشاورزان سختکوش و زحمتکش ایـرانی

طراحی نمایه صلاحیتهای شغلی مربیـــان روستایـــی سازمان ترویج کشاورزی استان اصفهـــان

مصطفی کرباسیون

Layout and design: Alireza Karbasioun

Front page: Shows different photos from various agricultural extension courses provided for farmers by the agricultural extension organization of Esfahan.

Back page: Background is a photo of women cooperating in farming activities in Iran and also the text is a summary of the thesis.

"In the name of Allah the compassionate the merciful"
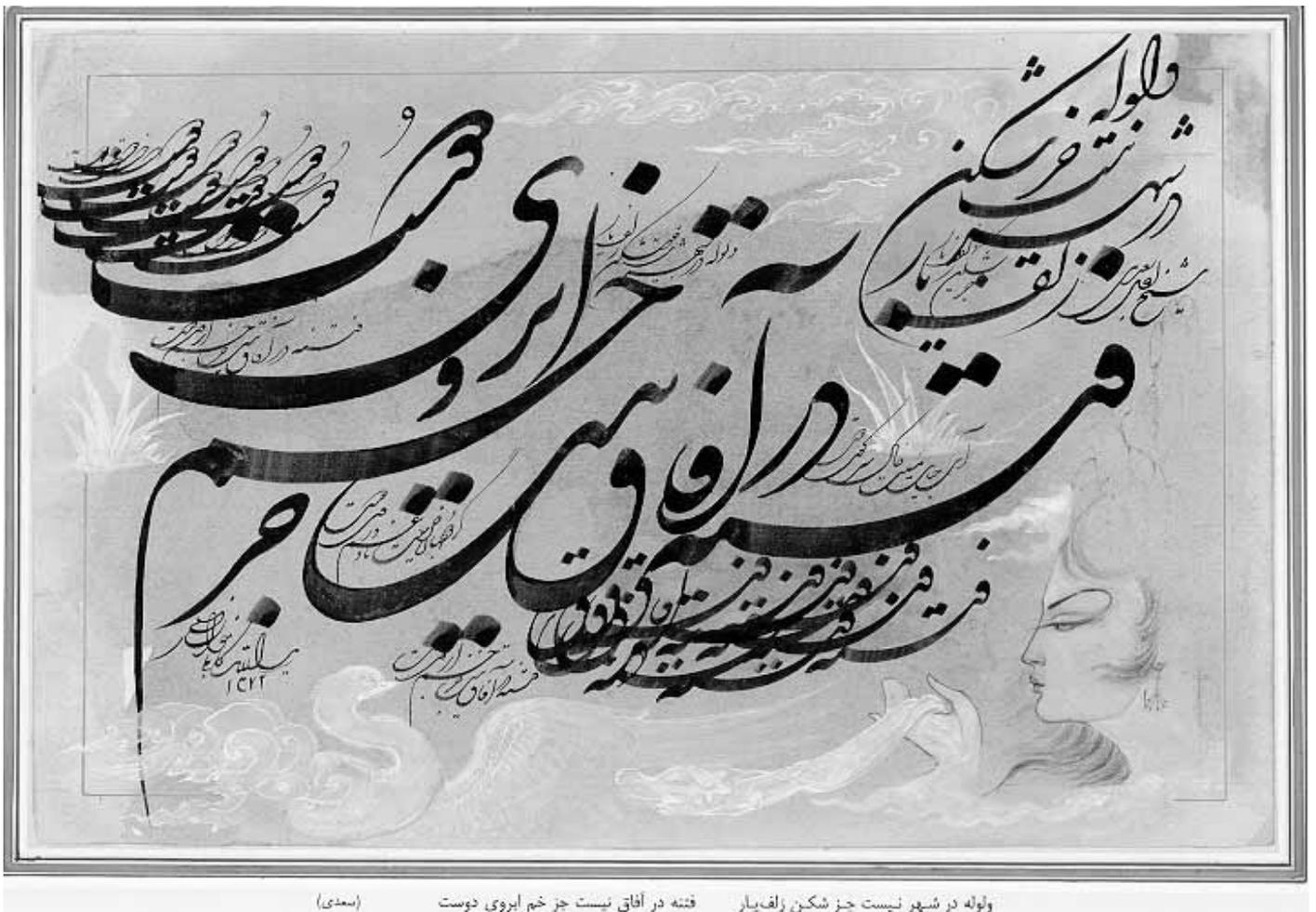
Some Persian calligraphy *entitled, " Shekaste Nastaelig"* written by a well-known Iranian calligrapher *Yadollah Kaboli* from a poem of *Saedi* (famous Iranian poet).

Translation: *there is no ruction in the city except the crease of my sweetheart's hair (God); and there is no uprising in the world except the arc of my love's brow.*