ARE SOUTH AFRICAN AGRICULTURAL ECONOMISTS ADEQUATELY SKILLED TO FACE FUTURE CHALLENGES?

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The agricultural science establishment experiences growing pressure from an unimpressed public. Like other agricultural scientists, agricultural economists must determine how to face future challenges. The profession's playing field has changed. Agricultural economists appear not to be open minded, adaptable and willing to push the boundaries of their discipline to be able to cope with secondary activities. An increasing number of limitations hampers the effectiveness of the profession and this may signal a need for curriculum revision. Departments of Agricultural Economics should recognise the importance of producing economically literate graduates who can function and perform in external environments. Curricular change must incorporate the inclusion of imaginative ideas development that will be able to connect economic rationality with changing perceptions. Services of academic institutions should involve *inter alia*, focusing their traditional efforts also on non-traditional markets; this provides some challenges of its own.

IS SUID-AFRIKAANSE LANDBOU-EKONOME TOEREIKEND OPGELEI OM TOEKOMSTIGE UITDAGINGS DIE HOOF TE BIED?
Die landbouwetenskaplike professies ondervind toenemende druk van 'n onbeïndrukte publiek. Soos ander landboukundiges moet landbou-ekonome bepaal hoe hul toekomstige uitdagings sal aanspreek. Die professie se speelveld het verander. Landbou-ekonome skyn nie 'n oop gemoed te hê, aanpasbaar te wees en gewillig om hul dissiplinêre grense te verwyd teneinde sekondêre aktiwiteite aan te spreek nie. 'n Toenemende getal beperkings belemmer die effektiwiteit van die professie en dit mag 'n nodigheid vir kurrikulumveranderings aandui. Landbou-ekonomie departemente behoort erkenning te gee aan die belangrikheid daarvan om ekonomies geletterde graduandi op te lewer wat kan funksioneer en presteer in eksterne omgewings. Kurrikulêre vernadering moet die insluiting van verbeeldingsryke idee-ontwikkeling inkorporeer, wat ekonomiese rasionaliteit kan verbind met veranderende persepsies. Dienste van akademiese instellings behoort onder andere dit te behels dat hulle hul tradisionele dienste ook op nie- tradisionele marke toespits; dit stel uitdagings op sigself.

1. Introduction

With human beings, as with their sciences, the primary aim of thought and action is to satisfy needs and to preserve life. The agricultural economics' profession appeared relatively late on the sceneand is currently activele involved in the agrarian sector. Framing of the place of agricultural economists in the twenty-first century requires a more pliant perspective on the discipline than is current in fashion (Libby, 1994). Agricultural economists have the responsibility to relieve the macro and micro problems in agriculture and related sectors. The professions' teaching, research, extension and attitudes must adjust to mutuality, from precise mathematical solutions to a more valid holistic approach, and from atomistic behaviour to co-operation. These required adjustments do not require a new profession, but a critical international evaluation of the existing profession in order to acquire a future vision, which will in turn address changes in the training of agricultural economists.

2. A critical international evaluation of the profession

Leontief (1971) once called agricultural economics "a profession maintaining a healthy balance between theoretical and empirical analysis and readiness of professional economists to cooperate with experts in the neighbouring disciplines". Close collaboration with agriculturalists provides agricultural economists with direct access to information of a technological kind including aspects like crop rotation, fertilizer, or alternative harvesting techniques.

Pre-occupation with the standard of living of the rural population has led agricultural economists into collaboration with home economists and sociologists, that is, with social scientists of the "softer" kind. While concentrating their interest on a single aspect of the economic system, agricultural economists demonstrated the effectiveness of a systematic combination of a theoretical approach with detailed factual analysis. They were the first among economists to make use of the advanced methods of mathematical statistics. However, in their hands, statistical inference became a complement to, not a substitute for, empirical research.

Without dispute, agricultural economics was developed historically within a specific institutional framework moulded by the politics of interest groups as represented by farmers' and commodity organizations. Agricultural economics has mainly entailed the development of concerning analysis justification of agricultural policies for the short- and long-run protection of differentiated farmers' interest groups. This could be maintained because of the agricultural economist's capacity to combine theory, quantitative methods, and data into useful analyses of problems faced by society (Tomek, 1993). However, there is a growing awareness that agricultural economists are not, in fact, doing this integration satisfactorily (Bonnen, 1988, 1991; Libby, 1994). One component of the problem is that econometric results are often fragile: small changes in the model or data result in large changes in empirical results (Leamer, 1983) and different models of the same phenomenon can yield conflicting results (Hendry & Richard, 1982). Consequently, the value of applied econometrics as a tool for analysis of problems or aid to decision-makers is reduced and questions, such as those pertaining to the future of agricultural economists, arise.

For agricultural economists, a reasonable concern rests on the paradigm shift away from a policy structure that

has been in place for many decades. A casual review suggests that the people at grassroot level changed considerably, whilst changes among economists operating in the agricultural sector experienced was only marginal. Too little has been done to consider alternatives to status quo or to develop criteria beyond the standard criteria, such as market stabilisation and farm income maintenance goals. A more extreme statement stems from Offutt (1993), namely that the profession has even done too little to illuminate or move the terms of the debate away from marginal analysis of the status quo. This can not be fully supported; for example a more active policy involvement resulted in liberalisation and deregulation of the South African agricultural sector. In formulating responses to emerging public concerns about food and agriculture, the agricultural economics profession should seek allies with forward-looking representatives of other agricultural sciences and economists. The profession must attempt to relate their research agendas to consumer interests, eg. decision-makers, politicans and agricultural scientists in an understandable fashion.

Agricultural economists research activities must relate to changing human needs, values and rules defining the obligations and opportunities of individuals and groups in the society; economists therefore have to deal directly with people, otherwise they have little to offer. Ignorance of human qualities, such as honesty, justice, sympathy and integrity led to Lux's (1990:90) observation that; "immorality finds its intellectual and theoretical justification in the name of economics". It is because of this notion that Libby (1994) views economists' problems stemming from pathological consequences of self-interest and the related mythology of independence. They are in direct confrontation with research and teaching. Future research systems will be based on user views and multi-disciplinary approaches. One implication is that, although agricultural economists are diverse as a group and have some of the economists' tendency to be less co-operative than other people (Frank *et al*, 1993), we as social scientists will not control the agenda as much as we have in the past. However, greater future diversity can be expected to strengthen our position to respond to the demands of the changing public research teaching and extension.

Agricultural economics must set higher standards of excellence in empirical research. A higher quality output requires more and better inputs both in terms of model specification, data, and the researcher's intellectual input. Furthermore, a radical change is needed in the way empirical research is conducted. As long as the profession, which has become too technique orientated (Pasour, 1993), remains loyal to the three methodological pillars of orthodox economic analysis, it will face limitations on its predictive and explanatory power (Rosenberg, 1993). These three pillars are (1) commitment to rational choice theory, (2) the requirement that aggregated data yield rational choice explanations and (3) the search for general equilibrium solutions. This loyalty will in the end be subject to the Leontief (1971) critique of that agricultural economists are indifferent the predictive weakness of their research and that the discipline is thus deprive of any claim to be an empirical science. A plea is thus made for improved robustness of results published in more readable journal papers on problem definition and heuristic applications of economic principles.

Tweeten (1993) observes that our profession consists of increasingly narrower trained specialists who are less and less willing or able to solve real world problems and effectively communicate the results to the public; these specialists write mostly for each other. This has to be addressed. The future of the profession depends largely on how well we serve the interests of students, food producers and consumers, rural South Africans, and the public at large. The need to provide sufficiently sound education and analysis of the food system, resources, and the environment should be reviewed. More resources should be devoted to environmental and resource economics, agribusiness economics, food and consumer economics, and rural development. Undergraduate programmes could be expanded to include processing, retailing, and other food marketing components.

Departments of Agricultural Economics at universities have a special responsibility to foster the diversity of the profession by making extra efforts to recruit qualified African students. Our profession needs to send a strong message to potential students about the high priority opportunities for future employment. Frankly, recruitment and retention of graduate students need to obtain a higher priority for most departments of Agricultural Economics. We need to identify and encourage diverse students who are qualified, particularly at the graduate level, for further training.

The agricultural science establishment has reached a major crossroad, and the Agricultural Economics profession is in an unique position to provide leadership at this critical juncture (Just & Rausser, 1993). As a social science, we are armed with many of the tools needed to educate and organize new political support groups for the agricultural science establishment. With our interdisciplinary linkages, we can influence the agricultural production sciences to focus on the public good and we can also draw on social science disciplines such as political science, public policy, sociology, and psychology to achieve support for public good activities. With our unique emphasis on a specific economic sector, we can sufficiently concentrate our effort to provide a valuable case study for the general science establishment.

However, the Agricultural Economics profession must first undergo a self-examination. It must recognize the increasing number of limitations hampering its output and effectiveness, such as data availability and policy adjustment rate. Further limitations, such as the concepts of applying optimality, economic rationality, and equilibrium and its econometric and programming techniques must be kept in mind. It must generalize its empirical paradigms to sweep aside self-imposed limitations and to make headway on collective decision-making. Models must become more understandable (not necessarily mathematical or statistical) to facilitate rather than obstruct communication among teaching, research, and extension activities and between professionals and lay audiences. Models should serve as an aid to economic thinking rather than as a substitute. They should teach economic principles, enable knowledge enhancement, and improve economic thinking, so that extension and outreach can be matched for potential users.

Furthermore, the Southern African region appears to stand in front of a near leadership crisis in scientific research and management. This is the result *inter alia*, the general lack of experience due to the high turnover of scientific and research management staff, imitative educational and research systems and a lack of an enabling environment that is capable of attracting and retaining good scientists and experienced researchers and trainers. Southern African agricultural economists will in the future have to be more innovative, self-reliant and original if the challenges of rural poverty are to be addressed adequately through appropriate agricultural production. Agricultural academic institutions therefore have a special responsibility not only to provide scientific leadership, but through appropriate curriculur reform, also to produce the type of agricultural graduate who will meet the needs of time.

3. A need for change in curricula?

The playing fields of the profession can be expected to change drastically. Agricultural economists could either live in isolation or, more desirably, move towards an integration with other professions. Agricultural economiss will increasingly be employed in new and completely different positions. A demand for more agricultural economists will probably arise in agro-industries, the public sector for data collection and policy analysis, and management in the non-public sector. The change in types of employment is evident from Figure 1. If present trends continue, the proportion of individuals associated with the classical employment opportunities in the profession will decrease. It is interesting to observe how the relative employment shares changed. Employment opportunities increased relatively in the government services and in the financial sector, whith a decrease noticed in co-operatives and boards. The professionals' qualifications working for traditional employers show some interesting trends (see Figure 2 & 3). The relative share of employed agricultural economists with PhD or masters-level qualification did not change over time. Measured in terms of increased access to knowledge and opportunities, this stagnation can be seen as a real decline. Only the finance group have employed a growing proportion of staff with masters degree qualifications. This may possibly be explained by the financial problems in the agrarian sector. The relative decline in the qaulifications profile raises the question whether agricultural economists are still successful by themselves or whether their involvement can be attributed to the fact that they are the counterparts of the managers of international institutions such as ISNAR, IFPRI, the Worldbank, etc.

How should curricula of agricultural economics change to improve the current realities and to address the needs? Turner (1995) argues that climates and incentives external and internal to education view teaching and research as substitutes rather than complements. This perspective underscores a deficiency in undergraduate education that has resulted from the current system of teaching. Though not debilitating in and of itself, theory and memorization must be a means to an end, i.e. analysis. Historically, agricultural economists have had a strong record of applying economic reasoning to a rich host of problems (Leontief, 1971). This tradition must now be extended to undergraduate training. However, before this can be addressed, the future demand of employers must be estimated. The departments of agricultural economists, i.e. production or marketing organisations with human products (Downey, 1975) should invest in products with the propensity to change, so that they can be assured of having available products for uncertain and changing times.

Research has to proceed proper and active teaching aimed at the desirable product mentioned above. Research is investigation, flowing from an inquisitive mind. It involves observation, definitions, objectivity (no political subjectivity), a connection to experience, and appreciation of failures to make progress in the learning process. The narrow education and orthodox research approaches have to be complemented by imaginative ideas. Turner (1995) argues that limited exposure generates graduates who think the only legitimate claim to a research product is an empirical analysis. His argument can be followed by analysing the composition of academic institutions' staff members. Many institutions employing agricultural economists show inbreeding, which certainly results in a narrower output.

Agricultural Economics departments need to recognise the importance of producing economically literate graduates, who can address external environments. The general underdeveloped students' sense of community must be replaced by a good understanding of social institutions and putting concepts into proper context. Students must be connected to the importance of economic reasoning and changed current perceptions; this will lead researchers to believe in continuous learning as a crucial ingredient to a successful scientific field. This could be done by applying the words of Schultz (1965) "another possibility ... is research at the undergraduate level in place of conventional classroom instruction". Courses, such as computer sophistication and value-add courses should be taught after-hours, to leave ample time available for core courses and their applications.

International experience indicates that small business programmes have the ability to attract students from outside the agricultural sector. Most of the students with small business interests do not seek for jobs in the traditional agrarian sector (Lee, 1994).

Agricultural economic curricula have traditionally offered courses in farm management. The relevance of these courses is questioned, since a much heavier emphasis on management have emerged. A working knowledge of small business is necessary in order to understand business problems and conduct a successful research and extension programme that can complement a teaching programme. In this respect, Akridge *et al* (1994) provided the following eight criteria to extend existing management courses to successful agribusiness professional education programmes:

- pick a niche;
- understand the clients needs;
- spend time and money on effective market communication;
- find an industry champion;
- locate and employ the best talent available;

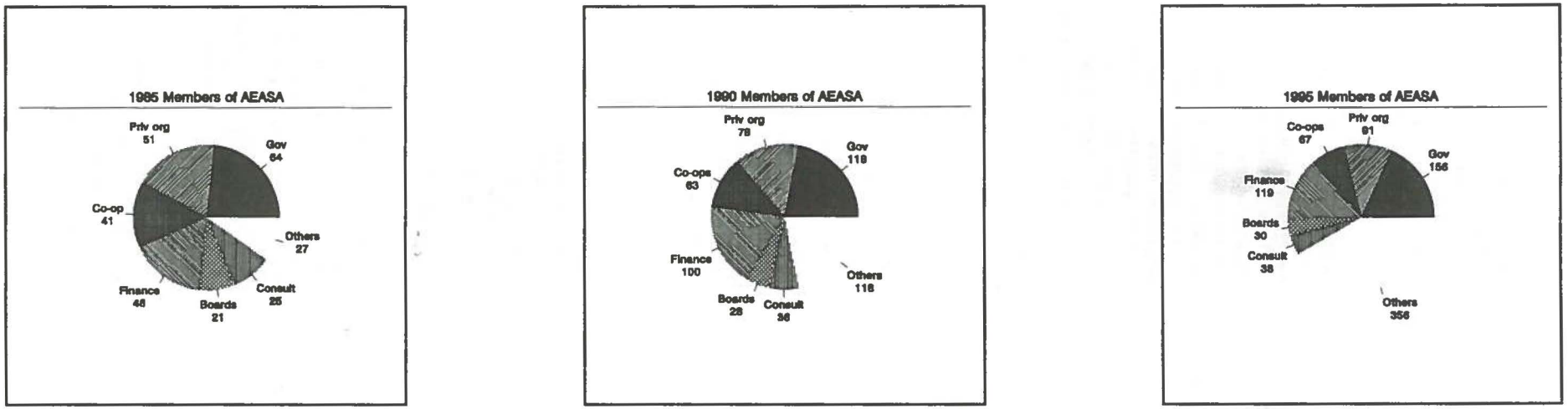

Figure 1: Employment of Agricultural Economists in South Africa

Note: In 1985, "Others" were 9.7% and in 1995 it was 41.4% of which 40% (144 members) are students. A new classification will be needed in future.

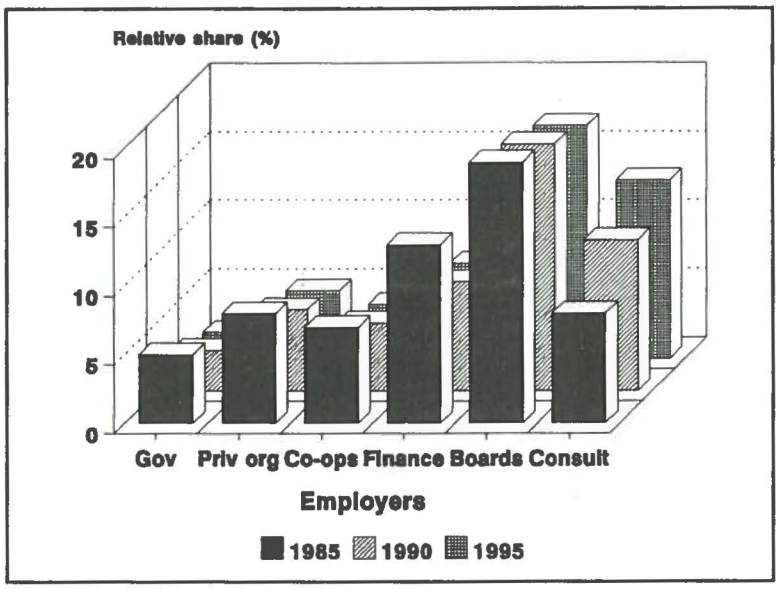

Figure 2: **Employees with PhD qualification (relative share per employer)**

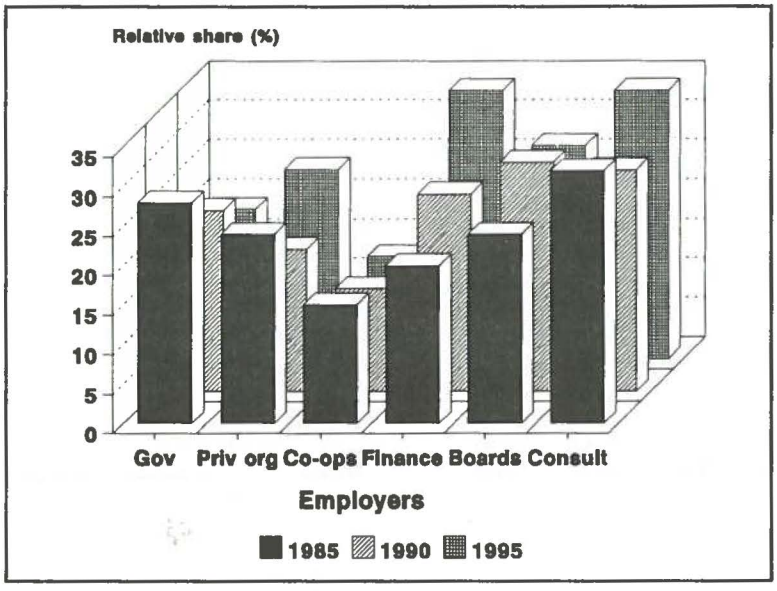

Figure 3: **Employees with masters degree in Agricultural Economics (relative share per employer)**

- deliver excellence on all logistical requirements for the programme;
- think long-term; and
- pursue linkages with teaching and research.

The above implies that academic institutions' services will involve focusing their traditional efforts on a nontraditional market, which has challenges of its own.

4. Conclusion

The agricultural economics profession is in the unique position to provide leadership in the reconstruction process of the agricultural science establishment. However, the increasing number of limitations hampering the output of the profession have to be addressed. The agrarian sector probably faces a near leadership crisis in scientific research and management. Agricultural economics must furthermore set higher standards of excellence in empirical research. Eventually, the future of the profession will depend on how well interests of students, food producers, rural South Africans, consumers and the public at large are served. The need to provide sufficiently sound education and analysis of the food system, resources, and the environment should be reviewed to fulfil the future employment needs.

A radical change is needed in the way empirical research is conducted. South African agricultural economists have to be more innovative, self-reliant and original in challenging issues such as rural poverty. Research models should serve as an aid to economic thinking rather than as a substitute. Methodologies used must be measured in terms of appropriateness and robustness. The research agendas must be related to all consumers in an understandable fashion, i.e. more readable journal papers on problem definition and heuristic applications of economic principles.

Agricultural Economics departments need to recognise the importance of producing economically literate graduates who can address external environments. They should teach economic principles, enable knowledge enhancement, and improve economic thinking, in order to match extension and outreach for potential users. Greater emphasis should be placed on modern problems and teaching techniques to increase students' proficiency in agricultural economics. Techniques will stimulate student imaginations, modify learning styles toward collaborative and independent learners, and stimulate interest in the subject matter. Recent emphasis on techniques, such as programmed learning, television and computer-aided instruction could stifle students, contribute to a rigid learning style and could fail to stimulate interest in the subject matter. Individuals' experience is needed to find the optimal adoption rate of traditional and modern training techniques. Curricula change rests on the inclusion of developing imaginative ideas through connecting the importance of economic reasoning to changes of current perceptions. This could be done by including more research at the undergraduate level in place of conventional classroom instruction.

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