Asian Journal of Business Management Studies 1 (1): 19-25, 2010
ISSN 2222-1387

Agricultural Research, the Most Important Option for Investment in Agriculture; Case of Kurdistan Province (West of Iran)

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Abstract: Agricultural research have very vital role in creation of knowledge and new technologies. New technologies will change conditions toward agricultural sustainable development if they are proper with farmer's situations and farmers use them optimally. In Iran's provinces especially Kurdistan, agricultural research have been purposed as an important exciter for development but it have confront with lack of adequate financial support since two ago decades. This study shows that agricultural research is the most important option for investment in Kurdistan agriculture sector. Analytical hierarchy process has been used so that four criterion and 12 investment options have been selected. 6160 pair wise comparisons were done by 22 agricultural experts in 2007. Results show that agricultural research with final weight 0.152 is the most important option for investment in Kurdistan agriculture sector. Based on Sensitivity analyze also, final weight of agricultural research have fluctuation between 12.4 until 16.5 but in all of the conditions, it is the most important. Kurdistan province has proper backgrounds for enhancement of agricultural research and the more attention is necessary especially based on environment sustainability and long-term programming.

Key words: Agricultural research . investment . analytical hierarchy process . kurdistan

INTRODUCTION

Alimental needs and Parts of employment in societies were being insured by Agriculture activities. Primary resources and labor for industrial sectors are supplied by this sector also. Meanwhile, agriculture has a good potential for foreign exchange value production.

Investment for rural and agricultural development has positive effects on rural welfare. Such investments generally execute in three backgrounds that are being indicated by development strategies such as rural infrastructure, research and education. Aim of investment in agriculture is development, agricultural development aims are agricultural investment aims really. Important of investment in agriculture have been proved almost in all of the countries and this process are being doing via different methods. Investment in agricultural research is more important for some of the countries in this regard and they investment more. We can refer to three international report results for confirmation.

The FAO researchers have obtained results in China that improvement in agricultural productions were being emergent from investment in rural infrastructures, irrigation systems and research in 1972-95 period [1]. World Bank experts explain concerning investment in agricultural sciences and technology that are very critical, effective in past and more important in future probably. Global development priorities for hungry and poverty diminishing by 2015, especially Millennium Development Goals (MDG) are concern to investment in agricultural research and development [2]. International food policy research institute (IFPRI) also has done a study in India and China for determination of agricultural development investment priorities. They choose three important options research and development, education and rural infrastructure respectively. Options of credit support, aquaculture, employment and irrigation have been selected as the second options [3].

Attention to investment in agriculture especially agricultural research is very important and vital for developing countries because they have proper backgrounds for development. Absolutely, Consideration to this process is significant for developed countries because can accelerate their development trend. These countries have cognized this proposition at least five decades of course and investment in agricultural research have been the more than developing countries ever since. Basically, Improvement in agriculture both can insure food security and reinforce other economic sectors.

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MATERIALS AND METHODS

Analytical hierarchy process was used in this study. Hierarchy constituted is Functional with three levels, the first is agricultural development, the second are four agricultural development aims and the third are 12 agricultural investment options so that every level was being compared to upper level. 22 provincial experts completed consignment questionnaires that were designed based on pair wise comparison in 2007. A judgment with consent was obtained through geometric mean by means of expert choice software.

RESULTS

Agricultural development aims priorities: Contemplated agricultural development aims (the second level) were environment sustainability (ES), food safety (FS), increase in production (IP) and employment (E). It was supposed that ES and FS had qualitative and IP and E had quantitative intendments in agricultural development background. Results shown ES and FS with final weight.377 and.327 respectively are more important than IP and E for investment. It seems that investment in agricultural qualitative dimensions is necessary apparently. Mentioned aims were arranged by final weight as important in Fig. 1.

Investment option priorities: Final weights of investment options have been obtained from relatives' weights patching. Results have shown agricultural research with final weight 0.152 was the most important option. Agricultural education and extension was the second option with final weight 0.105 also. The first option was considerable distance from other options. Based on final weights, investment option priorities were:

- Agricultural research (0.152)
- Agricultural education and extension (0.105)
- Changing in exploitation and production systems (0.099)
- Improvement of agricultural production conversion industries (0.099)
- Rural infrastructures development (0.096)
- Agriculture water management (0.093)
- Agricultural production marketing (0.071)
- Agricultural credits (0.067)

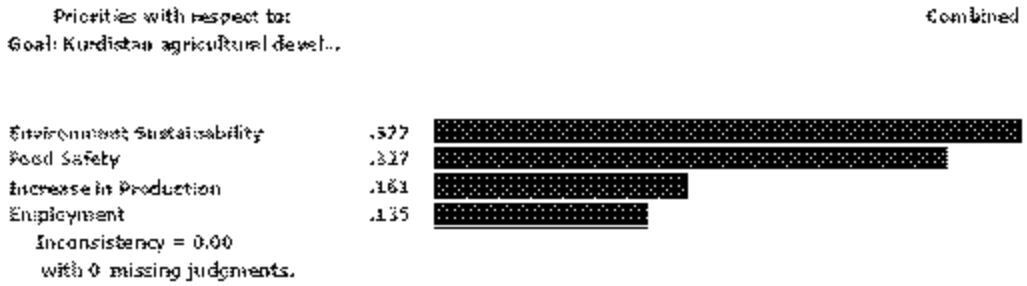

Fig. 1: Kurdistan's Agricultural development aims priorities in 2007

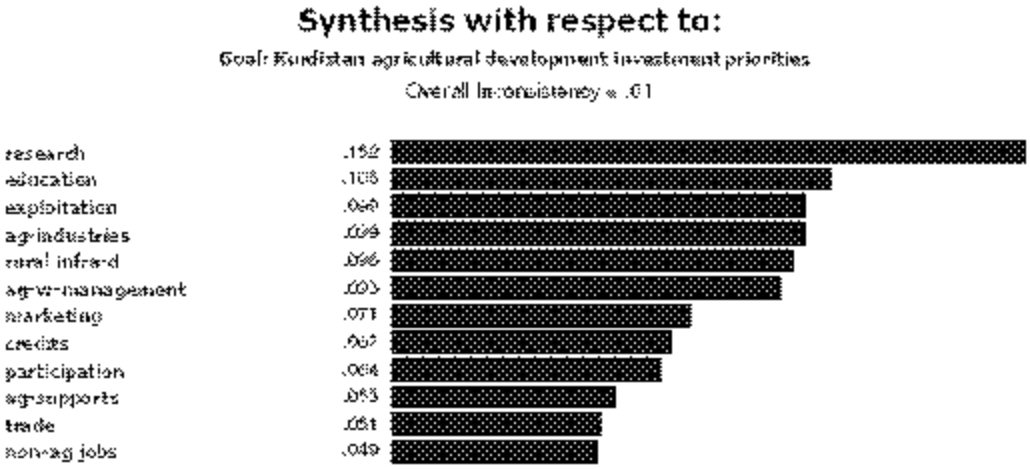

Fig. 2: Final weight of Kurdistan's agricultural investment options in 2007

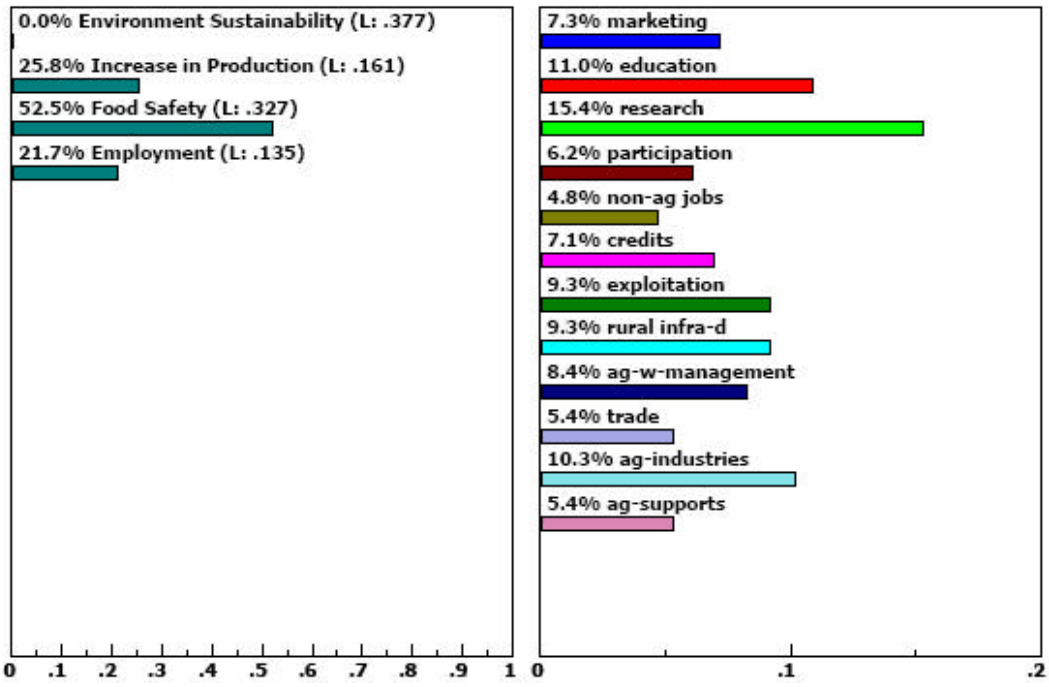

Fig. 3: Important percents of final weight of Kurdistan's agricultural investment options with omit of environment sustainability aim in 2007

- Public participation (0.064)
- Agricultural support services (0.053)
- improvement in agricultural production trade infrastructures (0.051)
- Non-Agricultural jobs (0.049)

Sensitivity analyze: When scales weight changes, priorities also change pursuant. We can study this shifts by sensitivity analyze. For example, it was supposed weight of the agricultural development aims changed, how many were final weight of options? Sensitivity analyze in this study was dynamic so that showed percent of important.

Sensitivity analyze based on elimination of environment sustainability aim: When weight of environment sustainability was zero, agricultural research was the most important option afresh. Comparison of new and old arrangements shown that agricultural research and Agricultural education and extension were the first and the second options so in new situation.

Six more important options for investment in new arrangement were; Agricultural research (15.4), Agricultural education and extension (11), Improvement of agricultural production conversion industries (10.3), Changing in exploitation and production systems (9.3), rural infrastructures development (9.3) and Agriculture water management (8.4). Percent of proposed investment for mentioned options were 64.

Sensitivity analyze based on elimination of food safety aim: New percents for important options were Agricultural research (13.8), Changing in exploitation and production systems (10.2), rural infrastructures development (9.8), Non-Agricultural jobs (9.8) and Agricultural education and extension (9.5) respectively.

In this qualification, important of agricultural research was decreased a little but it was the most important again.

Sensitivity analyze based on elimination of increase in production aim: In this condition, another aims have been changed a little. In the other hand another three aims wasn't very sensitive against increase in production change. When weight of increase in production was supposed 0, important options with final weight were: Agricultural research (14.9), Agricultural education and extension (10.4), Changing in exploitation and production systems (9.9), Improvement of agricultural production conversion industries (9.9), rural infrastructures development (9.7) and Agriculture water management (9) respectively.

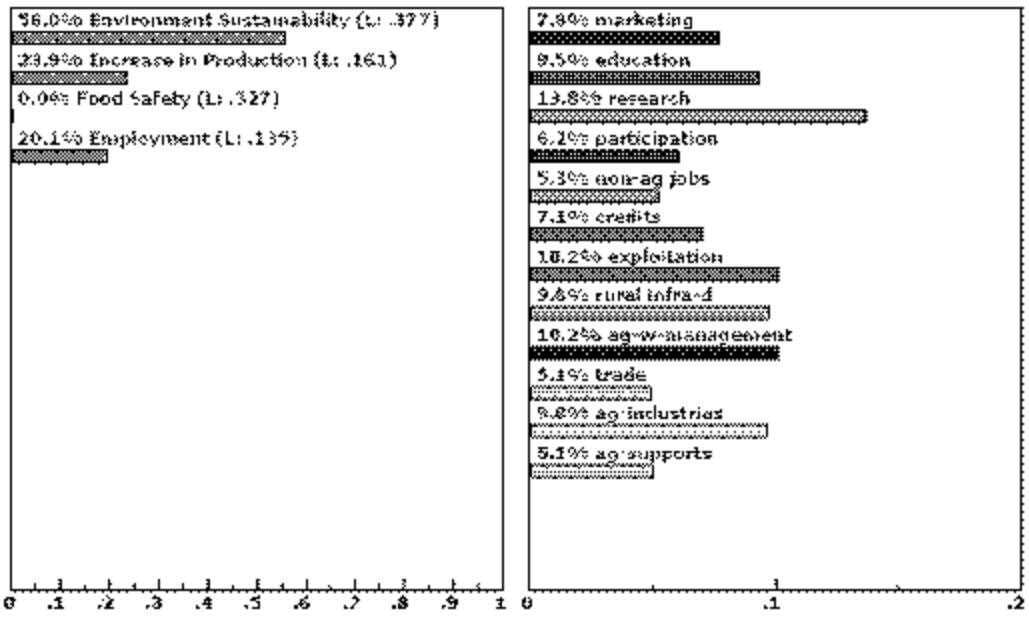

Fig. 4: Important percent of final weight of Kurdistan's agricultural investment options with omit of food safety aim in 2007

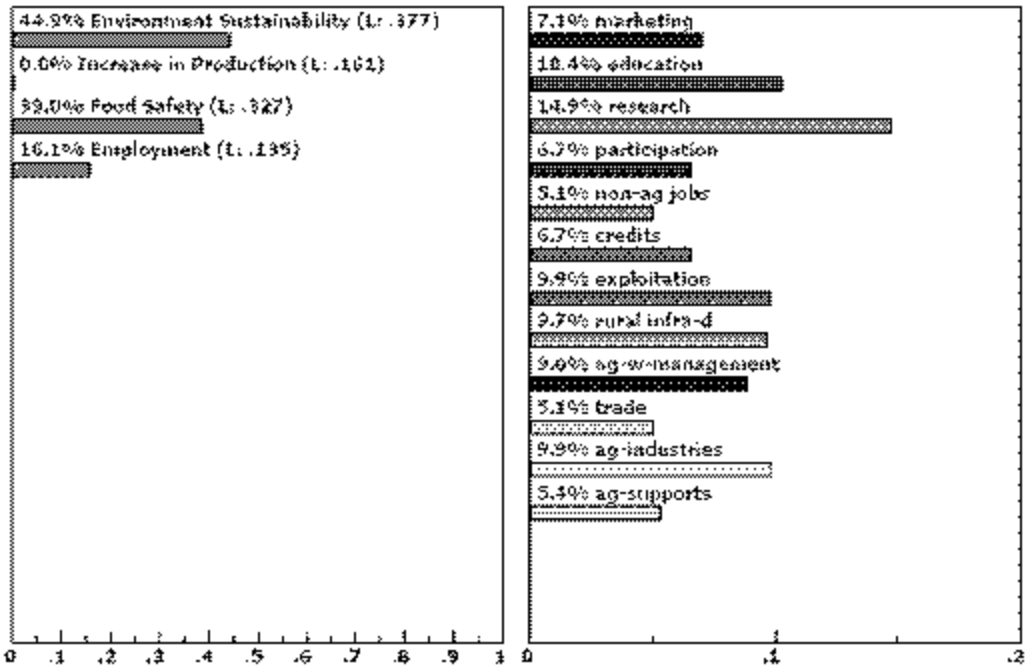

Fig. 5: Important percent of final weight of Kurdistan's agricultural investment options with omit of increase in production aim in 2007

Alike previous arrangement, the important of agricultural research has decreased a little but it was the most important option again.

Sensitivity analyze based on elimination of employment aim: In new condition, options were Agricultural research (16.5), Agricultural education and extension (12.2), Changing in exploitation and production systems (10.0), Agriculture water management (9.7), rural infrastructures development (9.6) and Improvement of agricultural production conversion industries (9.5) respectively.

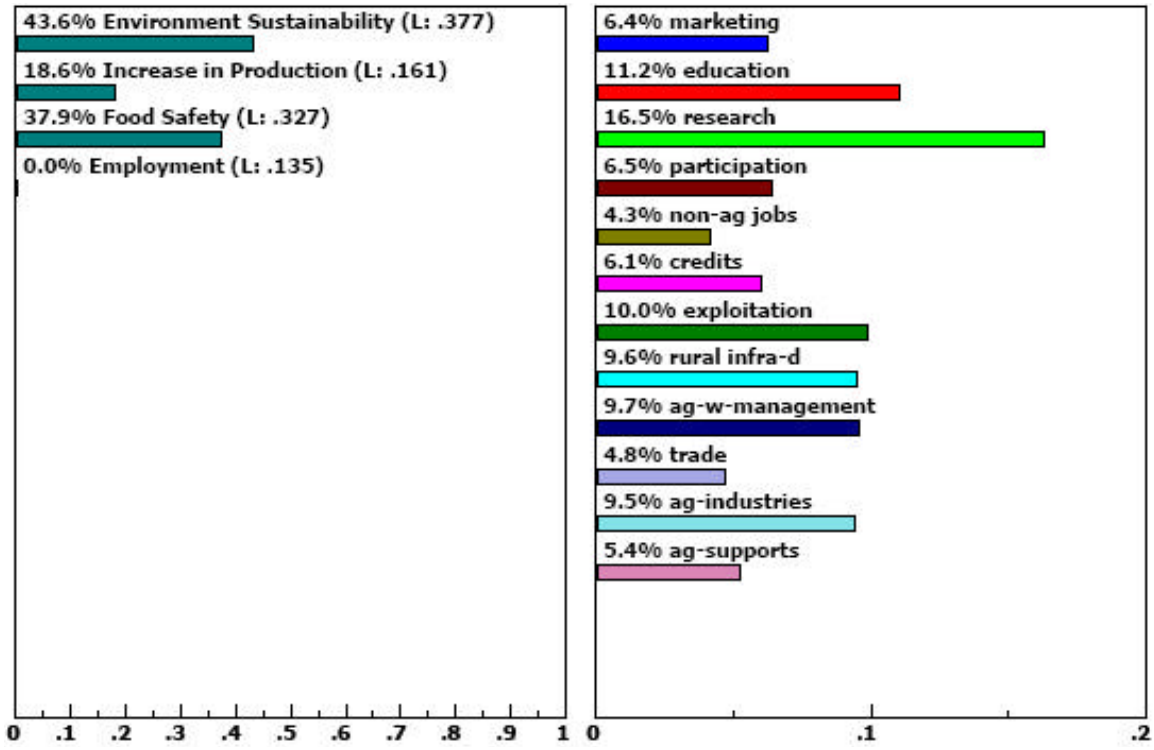

Fig. 6: Important percent of final weight of Kurdistan's agricultural investment options with omit of employment aim in 2007

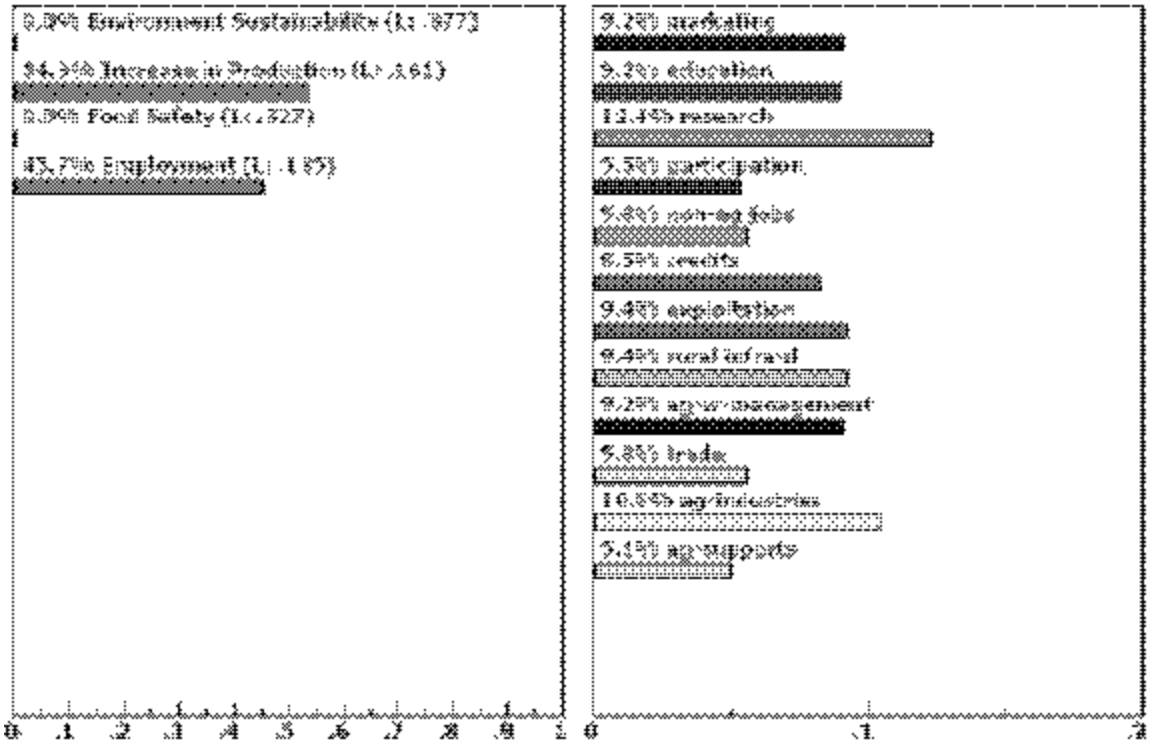

Fig. 7: Important percent of final weight of Kurdistan's agricultural investment options with omits of environment sustainability and food safety aims in 2007

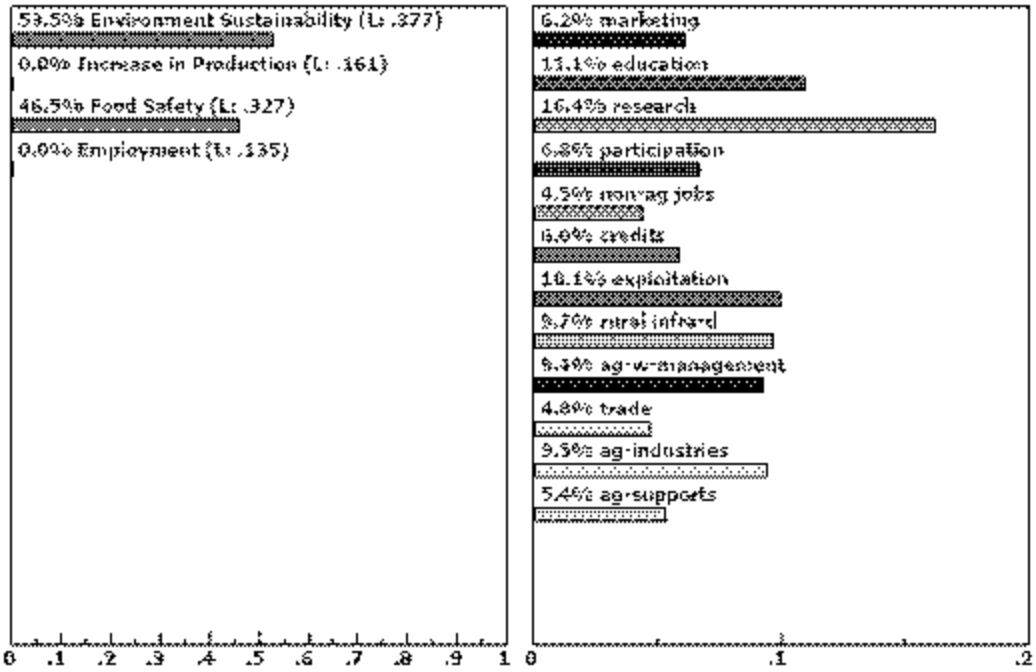

Fig. 8: Important percent of final weight of Kurdistan's agricultural investment options with omit of employment and increase in production aims in 2007

Fulfillment of mentioned supposition shown that the important of agriculture research has increased and it was more important option one more time.

Sensitivity analyze based on elimination of environment sustainability and food safety aims: In this condition, it was supposed if eliminated the aims that have qualitative dimensions how many changed final weights of another aims? Or, without environment sustainability and food safety aims, what are the priorities for investment? In new arrangement, the share of employment and increase in production were 45.7 and 54.3 percent. Indeed, quantitative aims had not high sensitivity against qualitative aims.

The important of agricultural research decreased a little but it was the most important option afresh.

Sensitivity analyze based on elimination of employment and increase in production aims: Unlike previous suppose, it was supposed that when we focused on environment sustainability and food safety as aims and unseen employment and increase in production, what changes appeared in aims and options? In new condition, important of environment sustainability and food safety aims increased to 53.5 and 46.5 respectively. The result shown changes in important of quantitative against qualitative aims were higher than contrary condition and if we consider either qualitative or quantitative aims, attention to qualitative aims is more logical. Of course, mentioned supposition in practices is unlikely because in an agricultural development integrated program have important both quantitative and qualitative aims. Overall, it was seen that qualitative aims as environment sustainability and food safety had higher important against quantitative aims like employment and increase in production.

In new arrangement, the options of Agricultural research (16.4), Agricultural education and extension (11.1), changing in exploitation and production systems (10.1), rural infrastructures development (9.7), improvement of agricultural production conversion industries (9.5) and Agriculture water management (9.4) were important respectively.

The important of agricultural research increased 0.2 percent and was the most important option once more.

CONCLUSION

In numerous texts have been emphasized role and important of agricultural research. In this study also, agricultural research have been recognized as the most important investment option in Kurdistan province at least in a long term landscape. New and appropriate techniques for production and resources exploitation will be found by agricultural research. Withal, development barriers will be specified by this option.

In sensitivity analyze distinguished that with more attention to investment options of Agricultural research, Agricultural education and extension, changing in exploitation and production systems, rural infrastructures development, improvement of agricultural production conversion industries and Agriculture water management, Agricultural development process will accelerate especially from environmental viewpoint. Maybe more attention to these options is helpful for other developing counties because these options have key role in agricultural development.

ACKNOWLEDGEMENT

This paper has been obtained from results of a research project with title of: recognition of agricultural investment priorities in Kurdistan province that done by author in 2007. Mentioned project had supported financially by agriculture and natural resources research centre of Kurdistan and Kurdistan's management and programming organization. Author also has special thanks for Dr. Hossien Sh. Fami from Tehran University that was project advisor.

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