

Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among Rural Youth in Iraq

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Abstract

The research aims to identify the training requirements for integrated management of diffusing agricultural innovation incubators among rural youth in Iraq. The working trainers working in public and private sector institutions have been targeted as a research community, A comprehensive stratified sample of (148) of the person under inquiry is taken, a questionnaire is prepared to reach to the objective of the research, included two axis ,and 20 items , The results showed that efforts to deploy agricultural innovation incubators among rural youth in Iraq and the targeting of the agricultural sector by government and public and private sectors requires providing development and training needs for the targeted rural youth by the dissemination of agricultural innovation incubators, as well as capacity-building and skills development needs for those working on the dissemination.

Keywords: Training Requirements; Integrated Management; Agricultural Innovation Incubators; Rural Youth; Agricultural Extension.

Introduction:

Although job creation is not a new topic in development cooperation, the focus on youth and rural employment is considered new in the field of rural development. We already know that agricultural value chains and other rural development projects have significant impacts on employment and job opportunities. (Knobloch & et al,2020:3), In 2017, (Group 20) launched a rural youth employment initiative to intensify efforts to promote employment opportunities for youth in rural areas of developing countries (OECD, 2023: 14-15) (G20 Germany, 2017: 1-6), The Committee on Rural Agriculture (COAG) at its 26th session 2018 stressed that supporting youth is essential to revitalize rural areas and ensure the achievement of the Sustainable Development Goals. The Committee on Agriculture also identified the regional approach as a comprehensive framework to revitalize rural areas and create youth-friendly jobs (FAO,2018:2-9) (FAO,2020:2) Creating an enabling environment is one of the key messages for policymakers in integrating rural youth into productive and environmentally sustainable agri-food activities (OECD,2018:3), a comprehensive five-year action plan (2021-2025) for rural youth at the organization level has also been developed for the United Nations, in collaboration with rural development agencies (FAO,2020:4-11), also requested that the Action Plan be updated to align with the FAO Strategic Framework for 2022-2031. FAO has indicated in its Strategic Framework for 2022-2031 that young people should be targeted as future stewards of the management of our agriculture and food systems (FAO,2021:2), The accelerating and cross-cutting elements of the strategic framework are technology, innovations, data and complementary elements of governance, human capital and institutions (FAO,2022:25) In light of this, Arab organization for agricultural development (AOAD) prepared the Strategy for Sustainable Arab Agricultural Development 2020-2030 as a revised and alternative strategy to the Arab Agricultural Development for the 2005-2025 Two Decades (AOAD, 2020:36).

In Iraq, agricultural development is a vital component of the Iraqi economy (Ramadan & Lafta,2023:2). this sector employs a fifth of the country's workforce, is the second largest contributor to GDP after the oil sector, and is a source of income for about %75 of farmers who focus on agricultural crop production throughout the country. in addition, the Iraqi national development plan (NDP) has identified agriculture as one of the main sectors to accelerate growth, increase income and improve gender equality, and it is estimated that more than 170.000 additional jobs could be created by the year 2030 with a moderate growth rate of %3 in agricultural production (SAAVI,2022:11-12), young people are two to three times more likely to be unemployed than adults, especially in rural areas(Knobloch et al,2020:10), as a result of the challenges they face from poor access to land, pressure on natural resources (Barman et al,2024:150), infrastructure, finance (OECD,2018:89), lack of technology, knowledge and training (Jasim et al,2016:2) and low wages of workers in the agriculture and food sectors (Knobloch et al, 2020:11) (Committee on world food security,2022:1), fragmentation of agricultural holdings, dependence on seasonal rains and the effects of climate change, difficulty accessing markets, poor participation in policy dialogues(Al-Hafidh & Lafta, 2023:2) (OECD,2018:89), lack of coverage of many agricultural subjects in school curricula, poor communication with researchers (Challob et al, 2020:373), perception of agricultural professions as high-risk (Barman et al,2024:150-153) prevents young people from farming, from staying in rural areas, the spread of unstable and seasonal work patterns, informal employment contracts and business work without any measures of social protection in terms of access to social security and benefits Other difficult and dangerous working conditions (Ternine & Castagnone,2018:1).

It is essential to take measures to make the agricultural and food production sector more attractive to young people and to enhance their income-generating capabilities (Committee on World Food Security, 2022:1) (Al-Hafidh & Lafta,2024:361). A study by (Gandure et al., 2013:50), indicates that agriculture remains the last resort for young people when choosing their career paths, therefore, access to agricultural extension services, such as training and support programs, resources, and links to financial services, is crucial in agricultural projects (Wale et al.,2021:8) and can significantly contribute to enhancing youth participation in the agricultural sector (Henning et al., 2022:10). A study by (Tolamo,2012:55-57), suggests that authorities should strive to attract young people towards entrepreneurship and participation in agriculture, as well as provide them with resources and knowledge, a study by (Adeyanju et al., 2021: 8-9), highlights the need for the government and other relevant stakeholders to take action for empowering youth through agricultural entrepreneurship by investing in training and educational programs is crucial, agriculture is considered central to all potential strategies for reducing youth unemployment.(Chipfupa & Tagwi,2021:9-10) noted that continued negative perceptions or experiences of the agricultural sector among young people will discourage them from pursuing it. Therefore, development partner programs should strive to create opportunities to introduce young people to successful farmers, providing those genuinely interested in agriculture with a different perspective, the study emphasized the potential for a youth-led agricultural transformation, however, as expected, not all young people will be interested in this sector, the study of (Ouko et al.,2022:2) suggested that the government should establish a development fund to support the launch of agricultural entrepreneurship projects and create agricultural incubators. These centers will contribute to achieving the Sustainable Development Goals and the objectives of Vision 2030, which aim to transform small-scale agriculture from subsistence farming into a modern, innovative, and commercially oriented sector, while simultaneously eradicating poverty and providing employment opportunities for young people.

Therefore, business incubators are an effective source for supporting and promoting creativity and innovation, and an important source for transferring advanced technology to projects, thus helping young people enhance their productive capacities. Consequently, the distinguishing characteristic of projects based on business incubators is innovation, quality, and growth potential (Hindi,2018:567). Agricultural business incubators have thus emerged as a driving force for change, promising to revolutionize food production and overcome the challenges of food security and sustainability, many countries around the world have moved towards establishing numerous incubators, statistics indicate that the number of incubators in the early 1980s did not exceed 200, while by 2011 it had reached more than 7,500 worldwide, this confirms the world's, and especially policymakers', awareness of their importance and role in economic and social development (Monkman,2011:33). A study by (Shami,2023:69) points to the limited spread of a business incubator culture in Iraq, a country that should encourage self-employment and the

private sector, due to the lack of a previous pilot study addressing this topic, of Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among rural youth in Iraq. Therefore, this research aims to answer the following question: What is the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among Rural Youth in Iraq?

Research objectives:

1. Identifying the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among Rural Youth in Iraq.

Materials and Research Methods:

Research Methodology: The current research comes within the framework of the Social Survey researches within the descriptive scientific research (Mahmudi,2019:46-55) (Pandey &Mishra, 2015:84-88), and is an appropriate method to achieve the objectives of the study by collecting data from those involved in agricultural innovation incubators, and analyzing them in order to come up with results on the subject of the study in order to reach conclusions and recommendations to improve the reality of the process of organizing and planning the deployment of agricultural innovation incubators, and also directs researchers to conduct more research and studies that deal with the fields and dimensions of agricultural innovation incubators.

Research community and its sample: The research community included all the governorates of Iraq except the governorates of the Kurdistan region, and also included all the respondents in those governorates as trainers in government institutions (public sector), the private sector, as a random sample of a comprehensive stratification of (%100) of trainers working in each of the northern, central and southern governorates of Iraq and in (5) governorates (Mosul, Baghdad, Maysan, Dhi Qar and Basra) being the governorates where there are the most number of respondents (trainers) in addition, those governorates were targeted by international development in the inclusion of a large sample of employees in the institutions of the Ministry of Agriculture and their graduation and the selection of (the best) among them that are available criteria of cognitive ability, skill and motivation to work in the field of agricultural innovation incubators as a specialized trainer, of which there are (148) trainers.

Data collection tool: The questionnaire was relied upon to achieve the study objectives as a tool to collect the required data through the respondents' answers about the areas, axes and paragraphs related to the problem of the current study, in addition to being appropriate to the research methodology used (Al-Jadri,2018:125), and being one of the tools most used by researchers in obtaining data from the respondents (Al-Husseini & Muhammad, 2020:224) By reviewing the literature related to the subject of the study in the field of the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators, and the opinions of experts and specialists from academic teaching and researchers concerned with the subject of the study, in addition to seeking the experience of the scientific supervisor, field visits by the researcher to some relevant institutions, A scale was prepared to build a proposed vision for the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among rural youth in Iraq in its initial form, which consisted of, (2) axes, and (20) paragraphs In order to verify the apparent validity of the tool and the validity of the content, the questionnaire was presented in its initial form to a group of arbitrators (experts) in the field of agricultural extension and field specialists in the field of business incubators, totaling (17) experts and specialists, the arbitrators (experts) were asked to state their approval of each field, axis and paragraph in light of a triple approval runway (agree, agree with amendment, Disagree) with the writing of the amendments they deem appropriate in strengthening and enhancing the scale, and it also set the cut-off threshold at %75 or more of the experts' approval score for the remaining areas, axes and paragraphs of the proposed questionnaire in its final form and recorded their answers for the period between 23/6/2025 to 13/7/2025. Based on the stages that the questionnaire went through, the number of paragraphs related to the proposed perception scale for the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among rural youth in Iraq that were included in the questionnaire in its final form became (20) paragraphs distributed over (2) axes. A pre-test of the study questionnaire was conducted on July 23, 2025, with a pilot sample of 30 respondents from the Agricultural Research Department/Ministry of Agriculture (excluding the sample). The overall reliability of the scale was calculated using Cronbach's alpha coefficient via statistical analysis software SPSS and yielded a value of 0.91, indicating the acceptableness of the scale for data collection in this study. Data was then collected from a representative sample of the research population, as previously defined and outlined in the research methodology, during the period from August 1, 2025, to November 20, 2025.

Presenting And Discussing the Results

Objective of the study: Identifying the Training Requirements for Integrated Management of Diffusing Agricultural Innovation Incubators among Rural Youth in Iraq.

Axis 1: Identifying the development and training needs of the targeted rural youth in relation to managing the dissemination of agricultural innovation incubators among them in Iraq.

The research results showed that the axes of the development and training needs of the targeted rural youth in relation to managing the dissemination of agricultural innovation incubators among them in Iraq, included (12) paragraphs distributed on a quadratic scale obtained a general arithmetic mean rate of (2.47) degrees, a general standard deviation of (0.62) degrees, a general weighted average of (2.48) degrees, and a percentage weight of (82.7) degrees, as shown in Table (1).

Table 1: distribution of respondents according to the rates of the axes of the development and training needs of the targeted rural youth for the deployment of agricultural innovation incubators

S/N	Themes	F	%	F	%	F	%	F	%	Av	St	W	W
1.	Preparing and implementing specialized training programs in technical, administrative, marketing, legal, financial, planning, digital technologies, artificial intelligence, and other fields for rural youth.	76	51.4	67	45.3	5	3.4			2.47	0.56	2.47	82.3
2.	Developing entrepreneurship skills in the field (administrative, leadership and entrepreneurial) to enhance the capabilities of rural youth to develop (innovative) business ideas, manage start-ups, entrepreneurial projects, market products, stimulate innovation and solve problems	80	54.1	65	43.9	3	2			2.52	0.54	2.52	84
3.	Providing a package of services to emerging projects, including training, mentoring, guidance, marketing, finance, and management for rural youth.	76	51.4	68	45.9	4	2.7			2.48	0.55	2.48	82.7
4.	Providing shared workspaces, including laboratories and equipment, for agricultural projects incubated by rural youth, to the extent permitted by the incubator's capacity.	86	58.1	58	39.2	4	2.7			2.55	0.55	2.55	85

5.	Providing ongoing support and follow-up in delivering intensive programs to help rural youth continuously develop their skills.	78	52.7	57	38.5	12	8.1	1	0.7	2.43	0.67	2.43	81
6.	Enhancing networking activity by creating communication networks (platforms) between rural youth, investors, and relevant government agencies.	83	56.1	54	36.5	10	6.8	1	0.7	2.47	0.65	2.48	82.7
7.	Providing modern training tools and materials through the issuance of guides, booklets, and digital training platforms that help rural youth to convey concepts and facilitate continuous learning and development.	85	57.4	49	33.1	11	7.4	3	2	2.45	0.72	2.46	82
8.	Building accredited and integrated training programs that serve as a reference for developing the capacities of rural youth working in incubators (incubator project owners).	84	56.8	53	35.8	10	6.8	1	0.7	2.48	0.65	2.48	82.7
9.	Implementing programs that combine theoretical and practical training for rural youth, including field visits to pioneering agricultural projects and hands-on workshops.	82	55.4	56	37.8	8	5.4	2	1.4	2.47	0.66	2.47	82.3
10.	Launching awards and competitions for entrepreneurial projects or innovative ideas in agricultural fields that represent innovative solutions to the challenges facing this sector.	86	58.1	51	34.5	9	6.1	2	1.4	2.49	0.67	2.49	83
11.	Highlighting the success stories of young people who have managed to establish successful agricultural projects	82	55.4	58	39.2	6	4.1	2	1.4	2.48	0.64	2.48	82.7
12.	Organizing mentoring programs, events, and workshops to introduce rural youth to agricultural innovation incubators and the services they provide, and to introduce their young entrepreneurs to their peers.	78	52.7	61	41.2	7	4.7	2	1.4	2.45	0.65	2.45	81.7
Overall Average										2.45	0.62	2.48	82

It appears from the above table that the paragraph (providing shared working spaces for laboratories and equipment for incubated agricultural projects adopted by rural youth as much as possible) obtained the highest weighted average of (2.55) degrees with a standard deviation of (0.55) degrees and the highest weight ratio of (85) degrees, this is because trainers realize that rural youth, regardless of their skills, do not have the financial ability to start their own businesses or purchase advanced technologies at the beginning of their project. Hence, sharing resources is the only practical solution to break the market entry barrier, having shared workspaces and laboratories allows young people to transform their ideas from paper plans into real models. It also facilitates the exchange of experiences between young people, which is a realistic requirement that can be implemented even on limited budgets. Working with what is available, although the paragraph (providing support and continuous monitoring in providing intensive programs to help rural youth to develop their skills on an ongoing basis) received the lowest weighted average of (2.43) degrees with a standard deviation of (0.67) degrees and the lowest weight ratio (81) degrees, this is because trainers believe that involving young people in intensive and continuous programs without funding or a work environment (laboratories and fields) causes frustration for the innovator. Therefore, coaches may prefer to focus on qualitative, specific support rather than ongoing, intensive support, which may not really pay off. Long training programs can also be a burden on young people, leading to their abandonment. Therefore, trainers tend towards short, focused programs that suit the schedules of young people in rural areas, this also reflects a trend towards reducing reliance on incubators by young people after establishing their projects. Furthermore, continuous support and intensive follow-up require a large number of staff, full-time commitment, budgets, and ongoing supervision. Trainers may consider this requirement unrealistic given the current capabilities of agricultural institutions in Iraq. Therefore, they preferred not to over-support a clause that might be difficult to implement effectively. Meanwhile, the remaining items within the "Developmental and Training Requirements of Targeted Rural Youth" axis ranged in weighted average between 2.45 and 2.52 degrees, with a percentage weight between 81.7 and 84 degrees. It is clear that the respondents agreed, on a four-point scale, to strongly agree with all items in the "Developmental and Training Requirements of Targeted Rural Youth" axis, as evidenced by their weighted averages (weighted averages) exceeding the hypothetical average of 1.5 degrees.

Axes 2: Identifying the capacity-building and skills development requirements for personnel involved in managing and disseminating agricultural innovation incubators among rural youth in Iraq.

The research results showed that the axes of the capacity-building and skills development requirements for personnel involved in managing and disseminating agricultural innovation incubators among rural youth in Iraq, included (8) items distributed on a four-point scale that obtained a general arithmetic mean rate of (2.45) degrees, a general standard deviation of (0.65) degrees, a general weighted rate of (2.45) degrees, and a general percentage weight of (81.8) degrees As shown in Table (2).

Table 2: Distribution of respondents according to the rates of the axes of the capacity-building and skills development requirements for personnel involved in managing and disseminating agricultural innovation incubators

S/N	Themes	F	%	F	%	F	%	F	%	Av	St	W	W
1.	Providing specialized training in the fields of agriculture, innovation and entrepreneurship by enhancing the skills of workers in using modern technologies, developing products and managing agricultural innovation incubators.	82	55.4	58	39.2	7	4.7	1	0.7	2.49	0.62	2.49	83
2.	Developing skills in managing and organizing agricultural innovation incubators by training incubator managers on managing incubator operations, supervision, planning, and coordination with relevant authorities.	81	54.7	59	39.9	7	4.7	1	0.7	2.48	0.62	2.48	82.7
3.	Developing employees' capabilities to use digital systems, analyze data, and draw conclusions.	77	52	60	40.5	11	7.4			2.44	0.63	2.44	81.3
4.	Designing training programs for incubator staff on how to mentor and support rural youth, foster a spirit of entrepreneurship, and provide technical and administrative guidance.	81	54.7	58	39.2	9	6.1			2.48	0.61	2.48	82.7

5.	Developing capabilities in performance evaluation and quality control by providing the key elements for incubator success including training, guidance, and consulting to monitor and evaluate the performance of agricultural innovation incubators and ensure improved performance quality.	72	48.6	65	43.9	10	6.8	1	0.7	2.4	0.64	2.41	80.3
6.	To equip workers with the ability to effectively train and guide rural youth, and to provide ongoing training.	78	52.7	62	41.9	7	4.7	1	0.7	2.46	0.62	2.46	82
7.	Training and empowering the incubator manager and staff by building their capacities in institutions to manage incubators and their operations in an integrated manner, in accordance with approved global standards and norms.	69	46.6	71	48	7	4.7	1	0.7	2.4	0.61	2.41	80.3
8.	Developing communication skills in the ability to convey information to the target audience, interact with them, and build good relationships with the local community, especially rural youth.	80	54.1	57	38.5	10	6.8	1	0.7	2.45	0.65	2.46	82
Overall Average										2.45	0.65	2.45	81.3

It is clear from the above table that the item (providing specialized training in the fields of agriculture, innovation, and entrepreneurship by enhancing employees' skills in using modern technologies, developing products, and managing agricultural innovation incubators) received the highest weighted score of (2.49) degrees with a standard deviation of (0.62) and the highest percentage weight of (83) degrees, this is attributed to the fact that those in charge must be experts who keep pace with development in order for the incubator to be attractive to young people, and who understand that the success of the incubator depends on the employees' ability to transform the young person's idea into a competitive commercial product. This requires an entrepreneurial mindset that many current employees lack, which increases young people's participation in the incubator and increases their confidence in it and their eagerness to join it as a result of the incubator's qualified employees. Also, the trainers in this item see the qualification of specialists who are professionals and capable of managing resources independently and solving technical problems internally without the need for foreign experts on an ongoing basis, which ensures its continuity even after the end of external support or grants, meanwhile, the item (developing capabilities in performance evaluation and quality control by providing elements of the incubator's success of training, guidance, and consultation to monitor and evaluate the performance of agricultural innovation incubators and ensure improved performance quality), and (training and empowering the incubator's manager and staff by building their institutional capacity to manage incubators and their operations in an integrated manner, according to approved international standards and practices) received the lowest weighted score of (2.41) degrees with standard deviations of (0.64, 0.61) degrees respectively and the lowest percentage weight of (80.3) degrees, this is attributed to the first item, as the trainers believe that agricultural innovation incubators are still in their early stages, and therefore focus their attention on launching initiatives. Trainers also fear that quality standards and performance monitoring will become obstacles that limit their creativity or consume their time preparing reports instead of engaging in fieldwork with young people. Some trainers believe that the success of an incubator is measured by its tangible results (number of successful projects, quantity of production). Regarding the second item, this is attributed to the fact that trainers find that the international standards and practices adopted in incubator management were designed for technologically and economically stable environments (such as Europe or America), meaning that there are differences in the challenges facing rural youth. There is also a prevailing belief that the success of an agricultural innovation incubator depends on the quality of agricultural guidance it provides, trainers also realize that their institutions operate under government regulations and a centralized financial system; therefore, training them in globally integrated operations management may make them feel inadequate, as they will not be able to apply those standards within a traditional administrative structure that does not grant them the necessary authority, in addition to the language barrier in training programs, the remaining points within the axis of (Capacity Building and Skills Development Requirements for Employees) ranged with a weighted average between (2.44 – 2.48) degrees and a percentage weight between (81.3 – 82.7) degrees, it is clear that the respondents agreed to strongly agree on all items of the (Capacity Building and Skills Development Requirements for Workers) axis, as their weighted averages were higher than the hypothetical average of (1.5) degrees.

Conclusions:

Working to disseminate agricultural innovation incubators among rural youth in Iraq and targeting the agricultural sector by governmental/public sector institutions and the private sector necessitates providing certain developmental and training requirements for the rural targeted youth by the dissemination of agricultural innovation incubators, this includes focusing on material empowerment and specialized training, as well as capacity building and skills development requirements for workers, emphasizing professionalism, competitiveness, and flexibility in implementation.

Recommendations:

It is essential to consider the requirements related to managing the dissemination of agricultural innovation incubators by governmental/public sector institutions and the private sector, particularly the Ministry of Agriculture, these requirements serve as guiding principles towards a sound and guaranteed path that achieves the objectives of the dissemination programs.

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