

THE EFFECTS OF JOB TRAINING ON FARM INCOMES: THE CASE OF THE KENTUCKY TOBACCO IN BENEVENTO AREA

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Abstract

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Since 2010 the decoupling of CAP aids was extended to the tobacco sector. Several studies demonstrated that tobacco is not profitable without EU aids and the survival of the sector is possible only if farmers undertake a strategy of costs decrease, if market price increases or farmers are able to enhance product quality. The present work analyzes how technical training can affect the economic performance of tobacco growers. The analysis summarizes the results of a project implemented within RDP 2007-2014 of the Campania Region and focuses on Kentucky tobacco, used in Sigaro Toscano[®], and on the implementation of leaves selection and setting up at farm level. Results demonstrate that these activities can help farmers to improve the production value and underlines the still relevant need of training and extension services.

Key words: business organization; product improvement; job training; farm income; Kentucky tobacco

Abbreviations: CAP – Common Agricultural Policy; RDP – Rural Development Programme

Introduction

Recent reforms of the Common Agriculture Policy (CAP) shifted the European Union (EU) support from the production to the farm, directing it towards competitiveness, efficiency and sustainable development criteria. These significant changes have also affected the tobacco sector for which EU aids were very large shares of the market value and whose future prospects depend on the farmers' ability to reorganize the production and the supply chain. In fact, in most of the Italian production areas the sector can survive only if farmers are able to reduce production costs or to get higher market price, by increasing their bargaining power with respect to manufacture industries and/or improving product quality (Sardone, 2008).

The Kentucky tobacco is the only cultivar used for the manufacture of Sigaro Toscano[®] and its production is mainly located in Tuscany, Lazio and Campania regions. In these areas, in spite of the long production tradition, product of-

ten does not fit the quality standards manufacturers require, with the consequence of lower prices paid to farmers and income losses for the entire sector. In some cases the quality improvement only require a re-organization of farm activities and a better selection of the leaves at farm level in order to better match the industry specifications. In fact, when bundles are not homogeneous they receive a grade that represents the average delivered quality and manufacturers pay a price aligned with the average level. In this context, farmers could increase their revenues by simply enhancing the leaves selection and set-up processes, which only require appropriate knowledge and skills. Extension services and job training, in particular, can play a fundamental role in this learning process and represent a key variable for the sector development.

The paper aims at proving this role by comparing the economic results of a Kentucky tobacco production before and after a technical training experiment. More specifically, the present work synthesises the results of part of a larger

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research project ‘Fired-cured tobaccos in Campania: new challenges for the supply chain of the Riccio of Benevento’, funded by Rural Development Programme (RDP) 2007-2014 of Campania Region and focuses on the implementation of sorting and minimum set-up at farm level in order to increase farmers’ revenues.

The paper is organized as follows. The first section presents an overview on the role of knowledge and training for the firm performance and growth, with particular reference to the agricultural sector. Then, the outline of the case study carried out within the project, is presented, which illustrates the grading process of the Kentucky tobacco, its effect on the product price, the methodology used to highlight the training effects and their economic results. Concluding remarks are reported in the last section.

Knowledge Transfer and Agriculture Performance

Knowledge transfer and innovation are the objects of the first priority defined by the new Rural Development Policy 2014-2020 (EU, 2013). They are considered a prerequisite for the sustainable development and are consistent with the overall goals of both the ‘Europe 2020’ strategy for a smart, sustainable and inclusive growth, and the Common Agricultural Policy (CAP). The first priority identifies specific intervention areas: innovation, cooperation and development of the knowledge in rural areas; the strengthening of links between agriculture, food production and forestry, on one hand, and research and innovation, on the other; the learning and vocational training in the agricultural and forestry sector throughout the entire farmer’s life. In particular, two measures are relevant¹. The first measure considers vocational training actions and the acquisition of skills through training courses, seminars and coaching, demonstration activities and information actions. The second one concerns consultancy services and assistance to farm management. In particular consultancy services may relate to a broad range of issues: farm adjustment, competitiveness, supply chain integration, innovation, market orientation, and entrepreneurship promotion. Thus, the higher attention of European Union (EU) to the knowledge transfer aims to the improvement of farm performance as a whole, not only as far as productivity is concerned, but also with reference to other issues such as the use of natural resources, the supply chain organization, the environmental sustainability. As a fact a better performance is the result of several factors that refer to farm organiza-

tion and characteristics, to physical resource endowment, as well as to market, technological development and economic context within which the farm operates. Other things being equal, the characteristics of the so called “human capital” can influence the economic performance and farm profitability because they affect the ability to manage the production factors, to process information, to react to demand changes, to adopt new technologies.

In literature, knowledge has long been recognized as an important factor of firm’s competitiveness and a key element of its ability to innovate. Its role has been analysed from approaches and points of view that differ with respect to the definition of knowledge (scientific and technological knowledge, capabilities and skills, information), the issue focused on (knowledge generation, management, protection, and policies), the level of analysis (firm, sector, economy).

In particular, two main approaches were developed which underline the role of knowledge in corporate performance and development. The resource-based approach looks at economic units in terms of resources endowment. It tries to decompose the *black box* of the neoclassical production function into several components and interactions and highlights the link among firm’s resources, productive opportunities, and firm growth and innovation (Penrose, 1959; Wernerfelt, 1984). In this view, knowledge is an asset that ensures higher returns and economic advantages to the firm, as far as it can act as a resource position barrier, on one side, and firms are able to implement a knowledge growth strategy, on the other side. The knowledge reaches a central role in the evolutionary theory, which addresses the firm behaviour issue in terms of skills, routines and learning and analyses technological advances as part of an evolutionary process (Nelson et al., 1982; Nelson et al., 2002).

The economic debate on the role of knowledge has focused on several different issues: its private or public character, the generation process, the tacit/codified nature and transferability. The meaning given to knowledge – know how, know what, know who or know why (Lundvall et al., 1994) – affects the relevance of each issue and has implications on the knowledge management at firm level as well as on innovation policies.

With specific reference to the agriculture, the sector is closely linked to the local context and therefore knowledge has been traditionally implicit (tacit knowledge) and has been handed down from generation to generation. During last sixty years, it assumed a more explicit nature and its diffusion was based on both the use of technical inputs and the mediation of agricultural extension services and farm advisors. Traditionally, the technological advance and the steady increase in the agricultural productivity was mainly per-

¹Annex VI of Regulation (EU) No.1305/2013 lists relevant measures to one or more of the EU priorities for rural development

ceived as science-based and from a policy perspective this view translated into a higher attention on research and a top-down approach in disseminating agricultural information and technological solutions. More recently, this paradigm has been questioned and there is evidence that the productivity increase is also linked to the spread of a more practical and applied knowledge, the sharing of tacit knowledge and a more effective diffusion of information (Esposti, 2013). Therefore, the process of knowledge transfer in agriculture is no longer conceived as a hierarchical and linear process, but is intended as participatory and systemic (Röling, 1992), where networks and interactions among the participants are very important. Indeed, social capital and local networks are relevant factors in driving the decision to use extension services related to information, knowledge sharing and diffusion, while the agricultural specialization remains the main factor to use specialized and targeted services (Pascucci et al., 2012). Social relations, knowledge and learning are therefore intimately connected to each other, interacting in a dynamic way (Tregear et al., 2016).

The literature review confirms the importance of education and training of human resources for the development of the agricultural and rural sector (Karbasioun et al., 2007; Hashmi et al., 2016). In last years, most of researches on this issue mainly focused on developing countries, as here agriculture still is the key sector to reduce poverty and interventions for Human Resource Development (HRD) are considered very important to increase farmers' knowledge and to encourage the adoption of new technologies (Zamani-Miandashti, 2012). In particular, educational and training plans are often addressed to women (Collet and Gale, 2009; Mudege et al., 2015) because they represent the majority of agricultural workers and their productivity is often constrained by a lack of appropriate skills (Danida, 2004). The role of agricultural extension services is changed over time. While during the Green Revolution era it was centred on the distribution of agricultural inputs and the handling of subsidies that were provided through agricultural development programs (Babu et al., 2013), nowadays they aim at helping farms to face the global competitiveness, dealing with technical and marketing aspects and matching them with requirements in terms of product safety (Palani, 2015).

In developed contexts, the diffusion of knowledge and information heavily relies on farmers' education and training contents need to adapt to new issues and farm's functions: environmental protection, product safety, social sustainability, new technical and economic solutions, management, marketing, and so on (De Rosa et al., 2013; Esposti, 2013; MiPAAF, 2013). Training is related to the prevailing model of agriculture and its efficacy is linked to the ability to

combine market variables, territory specificity and resource characteristics, by acting both on human and organizational variables. Moreover, based on the concept of organization as a learning entity (Senge, 1990) and on the organizational adaptability framework (Karadzic et al., 2013), recent studies focused on learning by shared experience in organizations. They consider it a factor that explains different levels of organizational adaptability to environmental and market changes, a component of the resilience concept (Karadzic et al., 2014a; 2014b). Recent studies confirm that collaborative learning activities in the agriculture sector, designed using experiential learning principles, provide a robust model for improving the capacity of farmers (Cliffe et al., 2016).

Generally speaking, the effect of training and innovation diffusion is the increase of agricultural income due to higher production, cost reduction, improved product quality (with a consequent increase in the price). Indeed, vocational training can deal with different aspects of the agricultural activity and its effects go beyond the purely economic profitability, affecting specific issues such as food safety, workers' health and work safety, environmental protection (Mancini et al., 2005, 2009; Birner et al., 2009; Soon et al., 2012; Morera et al., 2014).

Several studies have examined the link between training, education and agricultural economic performance (Kilpatrick, 2000; Nossal et al., 2009; Reimers et al., 2013). Nevertheless to isolate the effect of training on farm productivity and profitability is not an easy matter. Results of different studies have been controversial, mainly because of the experimental methods used, the choice of indicators and the different level of analysis, especially micro versus macro level (Xayavong et al., 2015). As a whole, education and training are thought to act by favouring the introduction of innovations, improving the access to information, increasing the ability to understand and evaluate information, enhancing the farmer's decision making skills (Nelson et al., 1966; Kilpatrick; 1997; Asadullah et al., 2009; Reimers et al., 2013; Xayavong et al., 2015). Based on the underlined link between training and agricultural performance, the present work assumes a micro level perspective and illustrates the results of a case study referred to members of Tobacco Producers Associations. They represent a good context for exploring social relations, knowledge generation and diffusion and the effects on farm's performance in economic terms. In fact, in order to obtain tobacco of high quality specific skills are required both in production and post-production phases. Generally, farmers focus their attention on the pre-harvest phases, but the post-harvest phases are equally important because they can determine a better evaluation of the bundles by the manufacturers and, consequently, a higher average price.

The work focuses on the role of technical training at farm level and measures the effects of a more careful product selection on farm profitability. In particular,

- through a first examination of evaluation of tobacco, it has been tested the effective level of knowledge by farmers in relation to the product selection process;
- a training experiment was carried out to transfer specific knowledge to tobacco farmers, complying with the buyer's specifications;
- results of a better selection were assessed in economic terms.

The Case Study

The Tobacco evaluation

The Kentucky tobacco is the only cultivar employed for the manufacture of the Sigaro Toscano® and the entire supply chain takes place in Italy. At farm level, two stages are very relevant after the harvest to determine the product quality: first, the fire curing that involves exposing tobacco to the heat and smoke so that leaves absorb the aromatic substances in the smoke, which will affect the tobacco's taste; secondly, the sorting and minimum set-up of tobacco that affect the evaluation of the bundles by the manufacturers and, consequently, their average price. Manufacturers and leaf dealers usually have their own grading system. In Italy, Manifattura Sigaro Toscano SpA (MST) bases the evaluation on 10 key parameters: corona, colour, maturity level, surface texture, leaf substance, elasticity, integrity rate, utilization rate, curing defects, stems and veins. In relation to these parameters, MST assigns a code that represents an indicator of product quality and identifies the final use according to the following scale: strips; filling; shredded product. Based on that, MST fixes the price. A first grading is made when the tobacco has to be purchased and serves as indicator of quality to define the price MST will pay to farmers. Once purchased, the tobacco is graded again (re-grading), in order to ensure that the quality is uniform throughout. It is important to note that if a bundle is composed by leaves with very different qualities, due to an incorrect sorting by the farmer, the assessment made by MST experts will synthesize an average quality. The result is the flattening down of the tobacco evaluation.

Therefore, in carrying out the sorting and making the bundles, farmers have to follow some specific steps. The first question is related to the leaf integrity. If the leaf is damaged, the percentage of injuries makes the difference on the potential use: if injuries count for less than 50%, tobacco has to be considered as filling, while damages higher than 50% make it shredded tobacco. On the other hand, if the leaf does not have injuries, the next evaluation step considers aspects

such as colour and leaf elasticity. If leaves are flawless and uniform in colour, they are classified as wrappers of high quality; when flaws are negligible and leaves can be used for more than 75% the quality is medium-high and leaves can still be used as wrapper material.

Another aspect to be considered in the evaluation is whether tobacco is 'set-up', that is it has some specific characteristics:

- ✓ stalks perfectly aligned;
- ✓ humidity close to 22%;
- ✓ bales or cardboard boxes with no less than 85% of leaves classified in the same grade group;
- ✓ bale weight no higher than 110 kg (for wrapper grade) and 120 kg for filler and shredded types;
- ✓ bundles with up to 25 leaves for the highest grades and 35 leaves in other cases;
- ✓ wrapper leaves must be selected according to colour (dark brown to light brown);
- ✓ leaves used as heavy or light filler must be selected with respect to texture, maturity and colour.

Grading and setting-up have a direct effect on prices farmers can get for their product. Table 1 shows the price Manifattura Sigaro Toscano SpA (MST) paid in 2014 with respect to each grade class. Data highlight how farm performance can largely depend on technical aspects related to the production process as well as to the handling of the product after the harvest. Moreover, the product setting-up guarantees a premium price to farmers from 40% up to twice as many what they get for no selected product.

Table 1
Prices according to tobacco grade (Euro/kg; year 2014)

Grade	Price (Euro/kg)
Wrapper	5.90
Set up Heavy Filler	4.10
Heavy Filler	2.93
Set up Light Filler	2.55
Heavy Shred	1.15
Light Filler	1.09
Light Shred	0.75

Source: MST- LEAF Italia

Data and Methods

The training experiment was one of the activities carried out in the context of the project 'Fired-cured tobaccos in Campania: new challenges for the supply chain of the Riccio of Benevento', funded by RDP 2007-2014 of the Campania Region (Measure 124). Farms taking part to the project were 11²,

² In the following farms are codified from F1 to F11 to preserve anonymity.

located in the Benevento province, one of the most important tobacco production areas where during the seventies over 50% of farms' production, employment and income was derived from the tobacco growing. In the early '90s, Benevento was the first province in Europe for the tobacco production, with an annual output of about 60 000 tons (Cozzolino et al., 2007).

Farms involved in the project are highly representative of the regional production of Kentucky tobacco. In fact, they account for about 13% and 11% of the Kentucky regional area and production, respectively. Moreover, they all are

family farms, thus representing the most common regional farm typology. As structural characteristics are concerned, the mean Utilized Agricultural Area is equal to 13.6 hectares and the tobacco on average weights for 6.9 hectares. The average figures hide very different situations in term of both total farm size and tobacco relevance with respect to other crops (Figure 1).

Besides the structural differences, technical and organizational differences exist, too, which affect yields and tobacco quality and, as a consequence, the economic performance (Figure 2). That reflects the regional differentiation of tobacco production and can be helpful to take into account the effect of the training experiment on different structural situations and to allow more general conclusions.

To test whether the training can help farmers to obtain a product that could better fit industry requirements and, as a consequence, get higher prices, a simple partial budgeting method was used to compare economic results of the product farmers currently provide to the industry and the value they could obtain if a re-organization of farm activities is made in order to better select and set-up the product at the farm level. In the partial budgeting method the focus is on the change in revenues and expenses related to a marginal adjustment (Kay et al., 2012).

The analysis requires a detailed identification of changes occurring from what is being currently done to the proposed alternative and the collection of information on cost and revenue changes if the alternative is implemented.

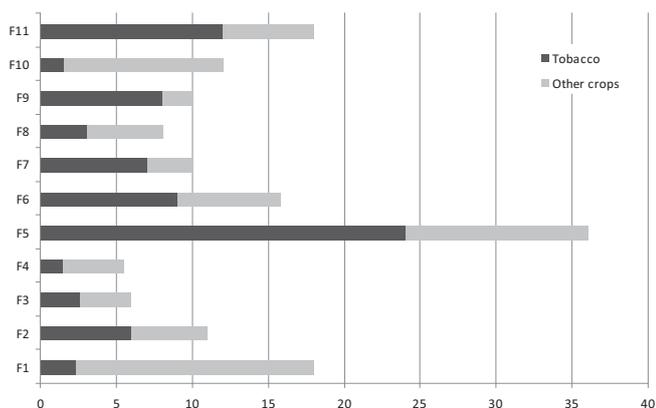


Fig. 1. Utilized Agricultural area of farms involved in the project: tobacco and other crops area (hectares)
 Source: authors' elaborations on field interviews data

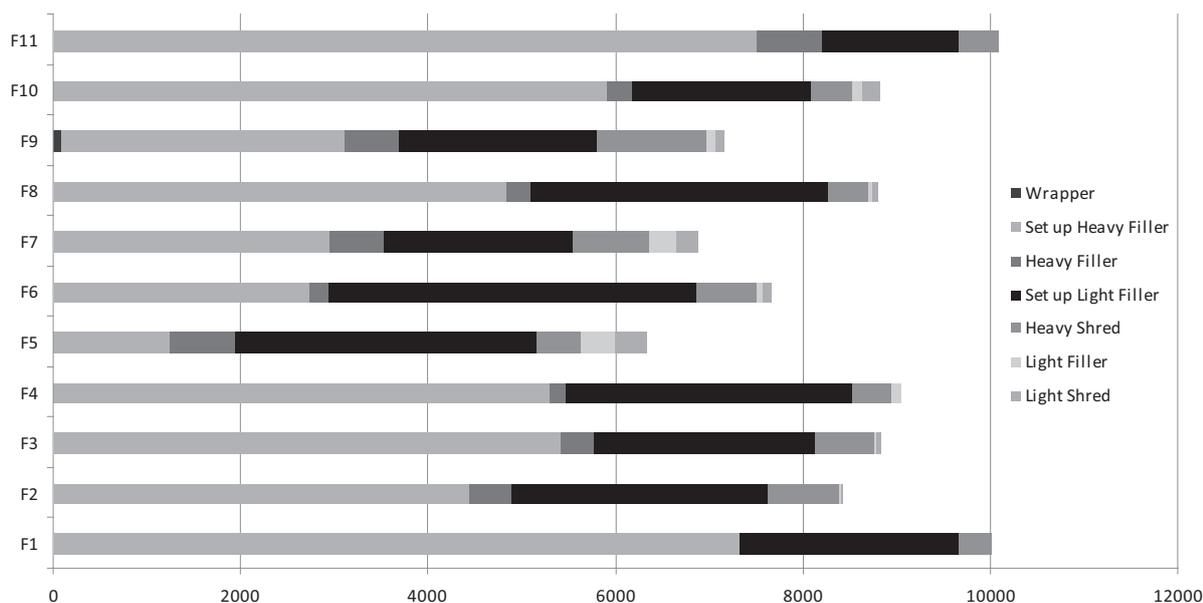


Fig. 2. Revenue per hectare of farms involved in the project by tobacco categories (euro/ha)
 Source: authors' elaboration on delivery bulletins data

Production data have been collected during three Technical Days carried out at the Sannita Cooperative Agribusiness Centre (CECAS), while prices and economic data have been acquired with reference to past product deliveries. In particular, as technical aspects are concerned, data collection was carried out according the following scheme:

(1) farms involved in the project were asked to provide samples of tobacco clustered according to the 'light' or 'heavy' weight they assigned to the leaves. Twelve 'light' and twelve 'heavy' samples for each farm were collected.

(2) Experts of the LEAF ITALIA of MST examined the samples and reassigned them to the 'light' or 'heavy' categories according to the manufacturer's point of view.

(3) Personnel of the involved Producers Associations carried out a training day on the selection and set-up of tobacco leaves. After the training, bundles selected in phase 1 were separated and leaves were re-classified by farmers in 'light' and 'heavy' samples.

(4) LEAF ITALIA experts evaluated the new samples according to the weight categories.

Farmers' and experts' evaluation before and after the training experience were compared in order to assess whether training was effective in terms of better answering to the industry parameters and requirements. Then, the change in farmer revenues was estimated by applying prices to each quality category before and after the training and taking account of higher costs required when selection and setting-up are made at the farm level.

The results

The comparison of evaluations made by farmers and industry experts before the training experience (Table 2) highlights that some tobacco samples were not properly assessed by farmers, and underestimation or overestimation errors occurred: 15.2% of the samples classified as 'light' by farmers have been evaluated as 'heavy' by the industry experts; on the contrary, 47.7% of 'heavy' leaves, according to the farm-

Table 2

Comparison of samples assessment according to farmers and industry experts before the training experience

	According to the farmers	Light	Heavy
According to the industry experts			
Light		84.8%	47.7%
Heavy		15.2%	52.3%
Total		100%	100%

Source: authors

ers, have been assessed as 'light' by the experts. Thus, farmers are not very able to evaluate and select their product and they more often seem to over evaluate their product quality. In order to improve the selection and set-up activities at farm level, they would need to be supported by appropriate training and technical advices.

As a fact, after the technical training carried out by the technicians of the Producer Associations, the farmers improved their evaluation ability and their classification was more accurate and coherent to the experts' parameters. The better selection at farm level had two consequences in terms of product quality:

(1) light and heavy samples were better identified with no error rate

(2) bundles quality was more homogeneous and that translated into a significant decrease of samples classified as shredded and an increase of the filler category.

Figure 3 shows that in a higher detail. The share of each grade category is compared before and after the training day. First of all, light types share decreased from 53% to 50% and a more careful selection brought shredded types from 30% to 12%. Moreover, a higher attention to the setting-up, to uniformity of bundles with respect to colour, moisture content and texture characteristics allows a better grading as a whole, with evident direct economic effects. Indeed, for

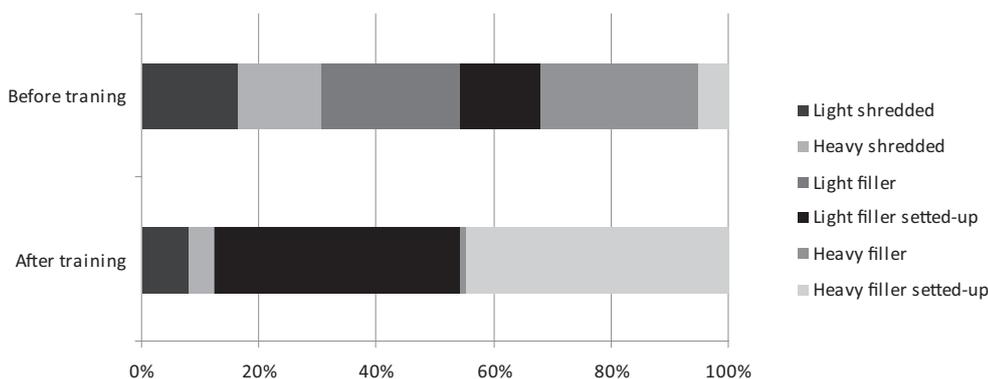


Fig. 3. Grading of tobacco samples before and after training of farmers
Source: authors

a given quantity of product, a more accurate selection and sorting and well-prepared bundles can enhance the product and make tobacco get a higher average price.

To assess the economic effects of bundle sorting at farm level, we compared the value of product assortments before and after the training net of the costs change due to a different farm organization. By considering the shares reported in Figure 3 and prices for each grade recorded in delivery notes for 2014 (Table 1), the value of 100 kg of tobacco increases from 189 euro to 303 euro (+60%).

As cost changes are concerned, the main factors to be considered are equipment and labour. The equipment to carry the sorting and assortment at farm level is rather simple and farmers only need tables and adequate light. Almost all farms involved in the project fulfil these conditions and the related costs can be considered minimal. As labour cost is concerned, in the study area most of the tobacco farms are small family farms and the selection and setup of bundles can be consistent with a better organizing of the available family labour force. Based on information of Producer Association technicians a skilled worker can perform the sorting of 150 kg of tobacco/day and the cost is about 55 euro per working day. This means that the cost of sorting accounts for 0.36 euro/kg of product.

Overall, the increase in value resulting from a better sorting is on average equal to 0.78 euro/kg. This can be due to the sharp decrease in the share of tobacco classified as shred type and, on the contrary, the increase of the share allocated to the filler category, in particular set-up category.

Concluding Remarks

The case study allows us to draw some important considerations.

Firstly, there are significant differences in production and economic performance among tobacco farms. Farms' yields and economic revenues per hectare highlight that production can be improved and higher economic results can be obtained by simply acting on current techniques (irrigation, cure, and so on). Secondly, the production of wrapper material is the most important strategy farmers should pursue to increase their income. However, all other condition being equal, the economic results could increase by improving the quality of the conferred product. A more careful sorting and assortment are indispensable tools for the enhancement of the product that better responds to the needs of manufacturers, but could also achieve higher average prices. In fact, the simultaneous presence of different product categories in a single bundle leads manufacturers to assign an average price

that is aligned to the lower category.

The training experiment carried out in the context of the project showed that farmers make classification mistakes: between 12% and 15% of samples considered light by farmers were classified as heavy by the experts; between 36% and 66% of samples considered heavy by farmers were classified by experts as light. The training day carried out by Producer Associations led to a remarkable improvement in the sorting activity and an increase in revenues. That confirms the relevance of the EU strategic approach that considered the knowledge transfer and the innovation as one of 6 priorities of Rural Development Programs and underlined the need of 'an appropriate level of technical and economic training as well as an increased capacity to access and exchange knowledge and information including through the diffusion of best agricultural and forestry production practices' (EU, 2013). Knowledge transfer should be adapted to the needs of rural actors and can take different forms, training courses as well as workshops, coaching, demonstration activities, information actions. Our case study showed that marginal economic improvements can be carried out thanks to a better and tighter relationship within the supply chain and can be based on very simple interventions, too. As a fact, learning processes can be based on a stronger co-operation between farmers and forward operators and on the re-organization of specific activities.

References

- Asadullah, M. N. and S. Rahman**, 2009. Farm productivity and efficiency in rural Bangladesh: the role of education revisited. *Applied Economics*, **41**: 17-33.
- Babu, S. C., P. K. Joshi, C. J. Glendenning, K. Asenso-Okyere and R. V. Sulaiman**, 2013. The State of Agricultural Extension Reforms in India: Strategic Priorities and Policy Options. *Agricultural Economics Research Review*, **26** (2): 159-172.
- Birner, R., K. Davis, J. Pender, E. Nkonya, P. Anandajayasekeram and J. Ekboir**, 2009. From Best Practice to Best Fit: A Framework for Designing and Analyzing Pluralistic Agricultural Advisory Services Worldwide. *Journal of Agricultural Education and Extension*, **15** (4): 341-355. DOI: 10.1080/13892240903309595
- Cliffe, N., R. Stone, J. Coutts, K. Reardon-Smith and M. Shahbaz**, 2016. Developing the capacity of farmers to understand and apply seasonal climate forecasts through collaborative learning processes. *The Journal of Agricultural Education and Extension*, **22** (4): 311-325. DOI:10.1080/1389224X.2016.1154473
- Collet, K. and C. Gale**, 2009. Training for Rural Development: Agricultural and Enterprise Skills for Women Smallholders. *City & Guilds Centre for Skills Development*, 24-30 West Smithfield, London, EC1A 9DD.

- Coppola, A.**, 2009. La riforma dell'OCM tabacco: il trade off tra sostegno alla produzione e sviluppo rurale. In: A. Coppola (Ed.), *Riforma dell'OCM e Sviluppo del Comparto Italia. Edizioni Scientifiche Italiane*, Napoli.
- Coppola, A.**, 2012. Prospettive di sviluppo della tabacchicoltura campana. In: R. Del Prete (Ed.), *Dentro e Fuori la Fabbrica. Il Tabacco in Italia tra Memoria e Prospettive. Franco Angeli*, Milano.
- Cozzolino, E., and V. Leone**, 2007. Tabacco in Campania: quali possibili alternative? In: D. Maglio (Ed.), *Le Colture Alternative al Tabacco nel Salento (Puglia) e Nelle Province Campane di Benevento e Salerno. Consiglio per la Ricerca e Sperimentazione in Agricoltura, Istituto Sperimentale per il Tabacco*, Roma.
- DANIDA (Danish International Development Assistance)**, 2004. Evaluation: Farm Women in Development – Impact Study of Four Training Projects in India, *Danish Institute for International Studies, Department of Development Research*, Denmark.
- De Rosa, M., L. Baroli and S. Chiappini**, 2013. The adoption of agricultural extension policies in the Italian farms. *New Medit*, **12** (3): 20-27.
- Esposti, R.**, 2013. Conoscenza, tecnologia e innovazione per un'agricoltura sostenibile: lezioni dal passato, paradossi del presente e sfide per il futuro. *Agriregionieuropa*, **32**: 61.
- EU**, 2013. Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005.
- Hashmi, M. S., M. A. Kamran, Kh. Bakhsh and M. A. Bashir**, 2016. Role of socio-economic factors on scale efficiency of cotton farms. *Bulgarian Journal of Agricultural Science*, **22** (3): 358–367.
- Karadzic, V., P. Antunes, and J. Grin**, 2013. How to learn to be adaptive? An analytical framework for organizational adaptivity and its application to a fish producers organization in Portugal. *Journal of Cleaner Production*. **45**: 29-37.
DOI: 10.1016/j.jclepro.2012.07.016
- Karadzic, V., J. Grin, P. Antunes and M. Banovic**, 2014a. Social learning in fish producers organizations: how fishers perceive their membership experience and what they learn from it. *Marine Policy*, **44**: 427-437.
DOI: 10.1016/j.marpol.2013.10.007
- Karadzic, V., P. Antunes and J. Grin**, 2014b. Adapting to environmental and market change: Insights from Fish Producer Organizations in Portugal. *Ocean and Coastal Management*, **102**: 364-374.
DOI: 10.1016/j.ocecoaman.2014.10.010
- Karbasioun, M., M. Mulder and H. Biemans**, 2007. Towards a Job Competency Profile for Agricultural Extension Instructors – a Survey of Views of Experts. *Human Resource Development International*, **10** (2): 137-152.
DOI: 10.1080/13678860701347115
- Kay, R. D., W. M. Edwards and P. A. Duffy**, 2012. Farm management, *McGraw-Hill International Edition*.
- Kilpatrick, S.**, 1997. Education and training: Impacts on profitability in agriculture. *Australian and New Zealand Journal of Vocational Education Research*, **5** (2): 11-36.
- Kilpatrick, S.**, 2000. Education and training: Impacts on farm management practice. *The Journal of Agricultural Education and Extension*, **7**: 105-116.
- Lundvall, B. A. and B. Johnson**, 1994. The learning economy. *Journal of Industry Studies*, **1** (2): 23-42.
- Mancini, F., A. H. C. Van Brugge, J. L. S. Jiggins, A. C. Ambatipudi and H. Murphy**, 2005. Acute pesticide poisoning among female and male cotton growers in India. *International Journal of Occupational and Environmental Health*, **11** (3): 221-232.
DOI: 10.1179/107735205800246064
- Mancini, F., Jiggins, J. L. S. and M. O'Malley**, 2009. Reducing the Incidence of Acute Pesticide Poisoning by Educating Farmers on Integrated Pest Management in South India. *International Journal of Occupational and Environmental Health*, **15** (2): 143-151.
DOI: 10.1179/oeht.2009.15.2.143
- MiPIAAF**, 2013. I giovani imprenditori e la formazione: un'analisi delle esperienze e delle attese. Rete Rurale Nazionale 2007-2013, Roma.
- Morera, M. C., P. F. Monaghan, J. A. Tovar-Aguilar, S. Galindo-Gonzalez, F. M. Roka, and C. Asuaje**, 2014. Improving health and safety conditions in agriculture through professional training of Florida farm labor supervisors. *Journal of Agromedicine*, **19** (2): 117-122.
DOI: 10.1080/1059924X.2014.891484
- Mudege, N. N., T. Chevo, T. Nyekanyeka, E. Kapalsa and P. Demo**, 2015. Gender norms and access to extension services and training among potato farmers in Dedza and Ntcheu in Malawi. *The Journal of Agricultural Education and Extension*, **22** (3): 291-305.
DOI: 10.1080/1389224X.2015.1038282
- Nelson, R. R. and E. S. Phelps**, 1966. Investment in humans, Technological diffusion, and economic growth. *The American Economic Review*, **56** (1/2): 69-75.
- Nelson, R. R. and S. G. Winter**, 1982. An Evolutionary Theory of Economic Change. *The Belknap Press*, Cambridge.
- Nelson, R. R. and S. G. Winter**, 2002. Evolutionary Theorizing in Economics. *Journal of Economic Perspectives*, **16** (2): 23-46.
DOI: 10.1257/0895330027247
- Nossal, K. and P. Gooday**, 2009. Raising productivity growth in Australian agriculture, Issues Insights, 09.7. *Australian Bureau of Agricultural Economics and Sciences*.
http://data.daff.gov.au/brs/data/warehouse/pe_abare99001675/a7.pdf
- Palani, K.**, 2015. Role of HR training in agricultural sectors in India: A driving force for organizational sustainability. *International Journal of Research and Development – A Management Review (IJRDMR)*, **4** (1): 56-63.
- Pascucci, S. and T. De Magistris**, 2012. Factors affecting farmers' likelihood to use advisory and extension services. *New Medit*, **11** (3): 2-11.
- Penrose, E. T.**, 1959. The Theory of the Growth of the Firm. *Wiley*, New York.

- Reimers, M. and S. Klasen**, 2013. Revisiting the role of education for agricultural productivity. *American Journal of Agricultural Economics*, **95** (1): 131-152.
DOI: 10.1093/ajae/aas118
- Röling, N.**, 1992. The emergence of knowledge systems thinking: A changing perception of relationships among innovation, knowledge processes and configuration. *Knowledge and Policy*, **5** (1): 42-64.
DOI: 10.1007/BF02692791
- Sardone, R.** 2008. Il Comparto del Tabacco in Italia alla Luce della Nuova OCM. *Studi e Ricerche, Inea*, Roma.
- Senge, P. M.**, 1990. Building learning organizations. *Sloan Management Review*, **32** (1): 7-23.
- Soon, J. M. and R. N. Baines**, 2012. Food safety training and evaluation of handwashing intention among fresh produce farm workers. *Food Control*, **23** (2): 437-448.
DOI: 10.1016/j.foodcont.2011.08.012
- Tregear, A. and S. Cooper**, 2016. Embeddedness, social capital and learning in rural areas: The case of producer cooperatives. *Journal of Rural Studies*, **44**: 101-110.
DOI: 10.1016/j.jrurstud.2016.01.011
- Wernerfelt, B.**, 1984. A resource-based view of the firm. *Strategic Management Journal*, **5** (2): 171-180.
- Xayavong, V., R. Kingwell and N. Islam**, 2015. How training and innovation link to farm performance: a structural equation analysis. *Australian Journal of Agricultural and Resource Economics*, **60** (2): 227-242.
DOI: 10.1111/1467-8489.12116
- Zamani-Miandashti, N. and I. Malek-Mohammad**, 2012. Effectiveness of agricultural human resource development interventions in Iran (three cases in Fars province). *Journal of Agricultural Science and Technology*, **14**: 11-25.

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