

OFFERING MECHANISATION SERVICES AS A WAY FOR INCREASING EMPLOYMENT OF LABOUR FORCE ON FAMILY FARMS DIRECTED AT CROP PRODUCTION

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Abstract

Hidden unemployment on family farms directed at crop production represents a favourable environment for the emergence and growth of rural poverty. Bearing that in mind, this research aims at investigating the possibilities that the labour force on the farms dealing exclusively with crop production can be better employed by providing other family farms with mechanisation services. Thus, an appropriate model of family farm is formed so as to serve for considering organisational and economic effects of offering mechanisation services to other farms.

The results of the conducted research show that in this way the family farms directed exclusively at crop production could additionally employ available resources, which in some months leads to increasing the employment of labour force on the farm by 58.72% and reducing the time available for doing other activities by 14.96%. Better use of labour force and mechanisation contributes to obtaining better results of farm operations, which can be seen from the growth of gross margin of the farm, as well as from gross margin per worker of 22.17%.

Key words: *labour force, employment, mechanisation, offering services, family farms, crop production.*

Introduction

The engagement of labour force on the agricultural family farms is one of the issues which has a very great importance, not only for the development of agriculture, but also for the whole rural development of the Republic of Serbia. Hidden unemployment on family farms represents a favourable environment for the emergence and growth of rural poverty. Although dealing with this issue has not received sufficient attention in the previous researches, however, some main features of engagement of labour force on family farms are well known.

When speaking of purely field crop operations, it can be stated that the utilisation of available labour force to a large extent varies during the year. Considering temporal distribution of expenditure of labour per some months Muncan et al. (2008) arrive at conclusion that work peaks on family farms directed at crop production (located in the lowland region of the Republic of Serbia) occur in April and October (since these are the periods of intensive works in crop growing). Nevertheless, available manpower is completely exploited only on the farms of the size exceeding 45 ha for the month of October and for those of the size exceeding 70 ha for the month of April.

Here, we come to the issue of small land areas which family farms usually own. On the basis of the data of the Treasury of the Ministry of Finance and Economy of the Republic of Serbia for 2008, which refer to the registered family farms in the region of AP Vojvodina, one can see that small family farms dominate - the farms that have less than 5 ha of land make

56% of the total number of registered farms, whereas the participation of the farms with the land area exceeding 10 ha amounts to only 18.5% (Todorović et al., 2009).

Similarly, researches of other authors point to the issue of extremely small land areas as one of the limiting factors for the development of agriculture of the Republic of Serbia. Hence, Bogdanov and Božić (2005) emphasise that on the area of the whole Republic only 5.6% of farms possess more than 10 ha of land¹.

On the farms owning small land areas, the exploitation of available labour is at a very low level. If one takes into account that these small farms dominate in the structure of land tenure of family farms of the Republic of Serbia, then it is obvious that there is an issue of large unexploited potentials of the labour force on the agricultural family farms, even in the months of intensive works in crop production (sowing and harvesting). Therefore, there are indeed most possibilities that labour force on the small farms dealing only with crop production can be more engaged, and proportionally to that, higher incomes can be generated on the farm. Thus, the farms must be directed at some additional activities, such as, for example, livestock production. Accordingly, Todorović et al. (2011) analysed the effects of the introduction of cattle fattening on purely field crop operations, which had very favourable impacts on the engagement of labour force even during the months when there is no work in crop production (December, January and February). However, it should be taken into account that this kind of extension of activities requires already existing facilities which can be used for cattle production or some investments are necessary for their construction.

For this reason, as a particularly interesting issue emerges the research of the possibilities that the labour force on the farms dealing exclusively with crop production might be better engaged by offering mechanisation services to other family farms and in that way more favourable effects of operations will be produced due to generating additional revenues from provided services. Bearing in mind that this change leads to an alteration in functioning of the farm, it is necessary to test economic justification of such business decision.

Material and method

As a source of data, interviews with the holders of family farms dealing exclusively with crop production from the regions of AP Vojvodina were used. In addition, a modern literature on the organisation of crop production was used. A detailed analysis of natural, organisational and economic conditions in which these farms operate was previously carried out so as to successfully accomplish the given aim, then the analysis of all available resources which are at their disposal as well as the analysis of production results.

The starting assumption of the research is that the family farm is planning to commence offering mechanisation services (services of sowing and harvesting) to other family farms in the nearby environment, so as to enhance the engagement of available labour force and the degree of mechanisation exploitation, and thus more favourable economic effects of business operations will be exerted. Mechanisation services would be carried out for the activities of sowing and harvesting of crops (that is, during April, July, September and October) since there is the greatest need for using mechanisation services for the aforementioned working operations (during the given months). The total scope of the aforementioned services which the farm (model) would provide is based on the evaluation received on the basis of a surveying of the family farms. For the other months during the year it is realistically difficult to predict the scope and the kind of services which can be delivered using mechanisation (and during some months these services cannot be delivered), thus, in this research the remaining part of the year is not taken into consideration.

¹According to 2002. Census the number of agricultural holdings in the Republic of Serbia was 778,891.

Offering mechanisation services is chosen because compared with some other possible activities it does not require the acquisition of new mechanisation (that is, it does not require any additional investments), which corresponds to the realistic situation on the surveyed farms. Therefore, it will lead only to the income rise due to offered services on the farm and to the rise of variable costs.

For the purpose of considering economic effects of offering mechanisation services to other family farms the model of field crop operations with the following characteristics is made:

- the farm is situated in lowland region;
- it has 22.94 ha of arable area of uniform quality and optimum plot size;
- deals with intensive crop production;
- 2 family members are constantly engaged on the farm;
- arable area is exclusively used for growing cereals (maize and winter wheat) and industrial crops (sunflower and soya bean);
- the whole arable crop production is market-oriented, that is, there is not any form of internal realisation of the obtained crop products;
- it is equipped with all needed mechanisation (both driving and towing units) so it has mechanisation which can be used for providing other farms with mechanisation services (universal combine harvester, grain drill and row-crop planter).

In the research, the analysis of economic effects of offering mechanisation services is conducted on the basis of gross margin, as a difference between production value and variable costs of production, since offering mechanisation services will not result in altering fixed costs on the farm. According to Gogić (2005) the fixed costs do not vary when changing the degree of utilisation of capacity, i.e. their total amount remains the same regardless of the amount of produced products or provided services.

Results and discussion

The results of the conducted research show more significant engagement of labour force in the analysed months on the farms which offer mechanisation services compared to the farms not dealing with the services (Table 1).

Table 1. The change of labour expenditure on the farm due to offering mechanisation services (per months)

Month	Spent time on the farm exclusively directed at crop production	Spent time on the farm directed at crop production and offering mechanisation services	Change (hours)	Change (%)
IV	58.29	88.81	30.53	52.37%
VII	48.03	73.54	25.51	53.11%
IX	51.78	102.80	51.02	98.53%
X	100.01	144.52	44.50	44.50%
TOTAL	258.11	409.67	151.56	58.72%

Source: Authors' calculation

In the observed months, the spent working time on the farm exclusively directed at crop production is 258.11 s, and regarding the farms directed at crop production and offering mechanisation services it amounts to 409.67 hours, so that the change of spent working hours, as a consequence of offering mechanisation services amounts to 151.56 hour, that is 58.72%. Observed per months, the highest rise of engagement was recorded in September (98.53%) which is twice higher rise than the rise recorded in the remaining three months in which it came to the change (April 52.37%, July 53.11% and October 44.5%).

Bearing in mind that the months in which it came to the rise of the engagement of labour force are simultaneously the months of intensive works in crop production on the farm which offers services, it is necessary to determine the time available for doing other activities (total and per months) before and after offering mechanisation services.

Since the time is better spent on the farms offering mechanisation services, it resulted in the decrease of time available for performing other activities (Table 2).

Table 2. Available time for doing other activities on field crop operations (per months)

Month	Available time for doing other activities on exclusively field crop operations (per months)	Available time for doing other activities on field crop operations also offering mechanisation services	Change (hours)	Change (%)
IV	220.34	189.81	-30.53	-13.85%
VII	281.13	255.62	-25.51	-9.07%
IX	266.84	215.82	-51.02	-19.12%
X	245.05	200.55	-44.50	-18.16%
TOTAL	1,013.36	861.80	-151.56	-14.96%

Source: Authors' calculation

The total working time which is available during the observed months to the members of the household for doing other activities (different activities outside the farm or some other agricultural or non-agricultural activities on the farm) is reduced by 151.56 hours, i.e. by 14.96% as a consequence of offering mechanisation services. Observed per months, the highest reducing is recorded in September (19.12%), slightly less in October (18.16%) significantly less in April (13.85%), and the lowest in July (9.07%).

It is obvious that on the farm offering mechanisation services there is still significantly available time for performing other activities even in the months of simultaneous conducting of intensive works in crop production on one's own farm and offering mechanisation services to other family farms.

Very important conclusions, regarding the economic effects of offering mechanisation services, can be drawn by calculating different indicators based on gross margin (Table 3).

Table 3. Economic effects of offering mechanisation services

Indicator	The farm exclusively directed at crop production (RSD)	The farm directed at crop production and offering mechanisation services (RSD)	Change (RSD)	Change (%)
Gross margin (total)	2,527,939.87	3,088,466.07	560,526.20	22.17%
Gross margin per worker	1,263,969.93	1,544,233.03	280,263.10	22.17%
Gross margin per working hour	5,624.25	5,138.61	-485.63	-8.63%

Source: Authors' calculation

The determined amount of gross margin at the farm level to a large extent influences the total business results, because all fixed costs are subtracted from this amount so as to calculate the profit. Taking into account that the fixed costs are constant, every change of gross margin at the level of agricultural farm is in the short term directly reflected in the amount of profit. The positive gross margin contributes to a covering of the fixed costs, thus, as stated by Ivana Ivkov et al. (2008), the maximising gross margin is equivalent to maximising the profit or minimising the losses.

Increasing the total gross margin of the farm, as well as gross margin per worker, amounting to 22.17% (as a consequence of delivering mechanisation services) shows that not only will the total farm profit increase, but that the effects of work of constantly engaged workers on the farm will improve as well. In consequence, even apart from the evident decrease of gross margin per working hour by 8.63%, the decision on offering mechanisation services is economically acceptable.

Conclusion

The results of this research should be regarded as a tendency for examining development models which would activate the resources of rural environments for the purpose of the rise of the employment and creation of additional income. Thus, it was found that along with more rational way of organisation of operations, which comprises the expansion of business direction towards offering mechanisation services to other family farms, the family farms directed exclusively at crop production could additionally exploit available resources.

It is confirmed by rising the engagement of labour force on the farm in the observed months by 58.72% and reducing the time available for doing other activities by 14.96%. Better utilisation of available resources, first of all, labour force and mechanisation, contributes to improving the results of operations which can be seen from gross margin of the farm amounting to 22.17%, and by the same percentage, gross margin per worker is increased. At this point, it is necessary to pay attention to the fact that regarding the analysed model of the farm (which has approximately 23 ha of arable land, which is the area significantly higher than the average at the national level) there is still much available working time which is not used. Therefore, these family farms, apart from offering mechanisation services, have to find additional ways in order to engage labour force (on the farm or outside it), or it is necessary to consider increasing of land areas which will be cultivated.

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