

Marketing of agricultural innovations within EU Horizon 2020's RRI concept - an integrated marketing communications perspective

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Abstract: Modern agriculture has been causing a headache for researchers worldwide for a long time, due to the necessity of more food to support the growing global society, that brought with it environmental and economic problems that highlight issues that weren't acknowledged prior to their emergence. Solution is necessary, and one of the few possible tools in resolving the inadequacies is innovation. Therefore, the EU introduced RRI (responsible research and innovation) as a pillar of innovation it wishes to lean on post 2020, to support and increase the efficiency of innovation, while dedicating significant funding to agricultural innovation. Our study aims to explore the possibilities of increasing the efficiency of agricultural innovation using integrated marketing communications as a supporting tool. Agricultural innovators were asked to provide input via deep interviews, and a questionnaire was conducted to test the application of the concept of using integrated marketing communications as the method of increasing RRI efficiency for agricultural innovation.

Keywords: AGRIBUSINESS, INNOVATION, HUNGARY, SME SECTOR, RRI, HORIZON2020, INTEGRATED MARKETING COMMUNICATIONS

1. Introduction

Modern agriculture has been causing a headache for researchers worldwide for a long time, due to the necessity of more food to support the growing global society, that brought with it environmental and economic problems that highlight issues that weren't acknowledged prior to their emergence. Meanwhile, the importance of agriculture, and innovations of agricultural nature leaning towards clean technology and climate-neutral solutions increase, mainly due to the World's food supply situation. There are already more than 700 million people worldwide malnourished, and climate change affects arable farmland negatively, worsening the problem. [1] Climate not only affects the World in terms of food production though – right after the effects of climate change started to gather the awareness of society, some concerns were already mentioned about the capability of farmers themselves to adapt to a changing climate. [2] Furthermore, agriculture also has its own effect on climate change: in 2015, approximately 20% (941.3 million tonnes of CO₂ equivalent) of the entirety of the EU28's emission (4548.4 million tonnes of CO₂ equivalent) came from the agricultural sector (this data excludes land use, land use change and LULUCF net removals). [3] Therefore, there are a multitude of problems to be solved regarding the effects climate change and agriculture inflict on each other. In order to dampen the effects of said climate change, it was suggested early on to rely on agricultural technology's research and development, and gather support from both public funding, and private sources. [4] The same incentive also permeated the European Union's directives, especially the concept of the 2014-2020 programme period dubbed "Horizon2020", further continued into the 2021-2027 programme period. [6] [7] As such, the participation, and the policy for adapting and accepting the EU directives by the SME sectors of various Member States is also advised, to be able to gain more assistance from EU funding.

2. Discussion

In order to ascertain the goals of the authors, there is a need to have a deeper understanding of the various concepts they wished to work with for the analysis, and the end goals they created for their work.

Considerations during the targets of the research mainly fell on the experiences that resulted from the EU Horizon2020 programme period, and the expectations from their continuation into the next programme period of 2021-2027. The peculiarities of the European Union's funding supports the pursuit of clean technology, sustainability and research and development. Therefore, the concept of a future innovation policy in a Member State such as Hungary also fell on said concepts. In light of these, the authors selected a few goals to attempt and understand during their research:

- The analysis of Hungary, as an EU Member State's SME sector, pertaining most notably to the innovation and research of agricultural nature that focuses on climate protection and sustainability.

- The assumption that agricultural innovations need to be marketed in order to be widely accepted stems from the nature of information technology, and modern information society. The authors believe that some form of marketing is necessary to support the coverage of new solutions and opportunities. As such, authors also aimed to identify current marketing approaches.

- The authors consider the process of integrated marketing communications the most adaptable to innovation marketing due to its consistent and client-focused nature. As the innovation policy of the European Union currently trends towards the RRI (responsible research and innovation) concept, which basically necessitates the focus on the consumer, and social acceptability of innovations, this decision was further supported. Therefore, authors attempted to analyse compatibility of integrated marketing communications with innovation marketing, and get a general overview of the information innovators in Hungary hold about the process.

- Finally, the authors wished to understand if applying integrated marketing communications will advance the innovator's firm as a whole, as it also includes an emphasis on organising inter-company processes related to communications and marketing into one whole process. As such, authors also completed a preliminary analysis into the feasibility for integrated marketing communications in an agricultural innovator SME by including some closed, and an open questions into the SME questionnaire.

2.1. Responsible research and innovation in the EU

Responsible research and innovation is the meeting point between sustainability and innovation for the European Union. The EU's directives contain the principle perspective of Schomberg on RRI – a process that is both transparent and interactive, taken up by the innovator and the people in society together, while also sharing responsibility with each other in terms of the ethical acceptability, the social desirability and the sustainability of both the overall innovation process, and the results born from it. [7] The reason for the existence of RRI is as Rip defines, the necessity of the activity aiming at research, development and innovation be welcomed by society as a whole, because society is what they're meant to improve. [8] The concept was considered by the European Union for a long time, and became the focus of the EU budget during the 2014-2020 programme. The aim was to make the future generations free of the consequences of our current generation's resource hogging tendencies, and lack of thought towards the future in general. Finally, after weighing initiatives and suffering several setbacks and obtaining positive results, the EU committed to sustainability, and as an extension, the introduction of responsible

research and innovation. This can be seen in various statistics – one such example is the gradual increase in RRI trends from 2014 to 2016, as seen in the work of Mejgaard et al. (Fig. 1):

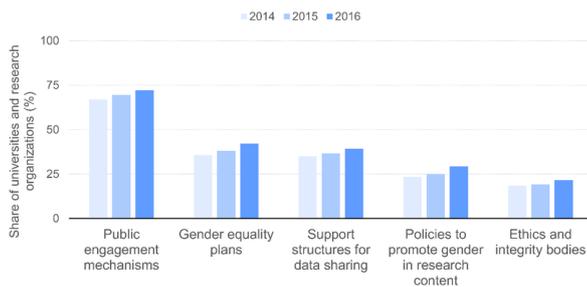


Figure 1: RRI indicator trends in European Universities. [9]

Such increase in the performance of various RRI indicators can be expected for the next programme period as well, due to the prolonged subsidy and strong interest of the EU.

The main perspectives of the Schomberg RRI concept that were also taken into EU directives are:

- Governance
- Public commitment
- Gender equality
- Scientific education
- Open access / open science
- Ethics
- Sustainability
- Social justice / inclusion. [10]

The authors' earlier research showed that although regional specifics may make it hard to adapt this concept in Hungary, and possibly other Member States with economic specialities similar to Hungary's, it is viable as a directive for SMEs, notably startup enterprises. [11]

2.2. Integrated marketing communications

The topic of integrated marketing communications has been garnering attention from experts since before the millennium. This approach to an enterprise's communications and marketing processes considers that the company's overall performance in both fields will increase if the two are synchronised and integrated from the first step of a concept, to the last of a marketing campaign. Brown stresses that integrating several communication tools creates a synergic effect, which will improve the efficiency and results of all of them. [12] In a similar concept, Godin considered online marketing more than simply relocating the marketing process to an online platform, but a process beyond that level. [13] It is important to note that the entirety of the marketing process, and the organised communication process are complex on their own, making the integration of the two even harder to realise in practice. Therefore, Caemmerer noted that planning and executing the marketing communications process is hard – there are a large variety of decisions to make which are focused on personalisation – while matching and balancing expectations and interests. [14] The main requirements of a communications and marketing practice that can be considered as an integrated method are as follows:

- The selection of the tools used for the communication process and marketing process in the perspective of compatibility,
- The compression of the marketing message (beyond the advertisement text) into one that's restricted to information useful for the consumer, and relevant to him,
- Cleaning the message of excess information (typical examples are jargon, or metrics the consumer won't understand, and professional

lingo), while making the retained information comfortable to absorb by the consumer,

- Organising both internal and external communications of the organisation in light of the above mentioned, thereby optimising the processes and taking consumer perspective into full consideration,
- Offering opportunities for feedback to the consumer, to further obtain optimisation criteria, making the consumer's values perceived closer to the organisations, which will, in turn, make the relation of supply and demand more balanced and efficient.

Hungarian SMEs were found to obtain better financial results, and more consumer satisfaction when abiding by the criteria of marketing communications properly managed in an integrated approach. [15]

2.3. Research sample

In order to answer the questions they initially had, authors conducted 10 deep interviews with agricultural SMEs that have conducted innovation processes in the last 10 years. Furthermore, after gaining an insight into the entirety of the topic, authors conducted a questionnaire with the participation of 37 different innovator SMEs in the agricultural sector of Hungary.

Of the ten leaders of agricultural SMEs who participated in the interviews, six have ownership of patents related to agricultural innovation. One of the ten has a patent related to agricultural GMO, while five own patents related to agricultural technology in practice. The interviews were semi-structured, generally took between 15 and 25 minutes each. Two of the interviews were conducted in person, six in online format, and another two via phone call.

The participants of the questionnaire don't have ownership of a patent, but two have applied for patent registration last year, both related to agricultural technology in practice. Eleven of the 37 SMEs have a relationship with Hungarian agricultural science institutions (laboratories, experimental farms, etc.). Seven of the 37 SMEs conducted process innovation, twenty-one conducted product innovation, four conducted organisational innovation, whereas the remaining five SMEs conducted combined innovation processes mainly focusing on service, due to the nature of the SME in question (f.e. agricultural IT management services). The questionnaire had two parts: first, there were a series of y/n questions and open questions to identify current marketing and communications practice, measure current knowledge about integrated marketing communications as a new / different approach (merged in results), and to evaluate the willingness to change communications and marketing processes within the SMEs. The second question group focused on the innovator's knowledge on the EU programme, more specifically about RRI and its various indicators. The intention was to measure the concept of RRI and its feasibility in the Hungarian SME sector's agricultural subsector, and evaluate how they see and interpret the process as a whole. Results reflect both the overall ideas of the agricultural SMEs and the specific ideas about interpretation of EU standards in regards to the RRI concept and its related information.

3. Input of SME innovators (interviews)

The main results of the interviews were the following:

- Currently, the innovator SMEs are more open to committing more resources to marketing purposes. According to the Hungarian Marketing Association, SMEs in Hungary tended not to have specialised marketing processes before the early 2000's, and post-2016 are catching up, going more in-depth with their marketing processes. The interview participants almost all noted that they have increased their marketing expenditures in recent years one way or another, which is consistent with other SME spending from different sectors. [15]
- Most of the innovators were either already conducting an integrated marketing approach, or knew about the process, and were

willing to adapt it in their enterprises. The ones conducting it already also noted the high efficiency and versatility of the approach, and were satisfied with results up to the period reviewed by the research.

- The main concern for the participants was expanding on their currently employed communication channels. Most participants were using the internet, more notably the social media platforms to advertise their innovations, which is likely due to budget constraints. This is an overall concern for SMEs in Hungary. [15] Beyond budget concerns, social media is a clear-cut, quick and easy solution for companies to advertise on, find and interact with their clientele, and conduct nearly all generic customer relation, public relation and customer feedback collection activities.

A summary of the interviewees' main directives can be seen below (Chart 1). Questions of the Y/N variety could be skipped where applicable (as such, if the participant didn't note that their SME is conducting IMC, they didn't need to comment on its efficiency, however, were asked to comment if they'd adapt IMC later).

	Yes	No	N/A	
Knows IMC?		7	2	1
Conducting IMC?		5	3	2
Is IMC effective?		5		5
Willing to move to IMC?		3	2	
Expects better efficiency?		1	2	
Easier on budget?		2		
Knows RRI?		8		2
Follows RRI concept?		3	4	3
Applies for subsidy?		5	4	1
Comm. channels used		1	2	3 or more
		4	3	3
Willing to use more?	Yes	No	N/A	
		7	2	1
Specifically social media?	Yes	No	N/A	
		4	5	1

Chart 1: Summary of the general attitudes towards the research topics among interview participants (n=10). Source: self-made, 2020.

4. Questionnaire results

The results from the questionnaire showed that when planning innovation processes, most SMEs in the Hungarian agriculture sector don't specifically aim to conform to the requirements of RRI. While most companies have some sort of sustainability consideration, specific EU directives are not the focus of the process of innovation yet. However, the results and comments of the SME owners suggest that they have some form of consideration related to the RRI concept's indicators (mostly to 'education for science' via relationship with universities and scientific institutions, 'public commitment' and 'inclusion' via early testers and volunteer aides, etc., and 'gender equality' – this latter is more related to legal bindings in effect, than specifically any target related to it in SMEs that have a largely external employment structure, and the number of females and males in a family for smaller, family SMEs).

Results of the first question group can be seen in the following part (Chart 2).

	Yes	No	N/A
Knows IMC?	19	8	10
Conducting IMC?	12	7	
Is IMC effective?	10	2	
Willing to move to IMC?	6	1	
Expects better efficiency?	3	3	
Easier on budget?	3		
Knows RRI?	10		2
Follows RRI concept?	7	2	1
Applies for subsidy?	5	2	

Chart 2: Summary of the general attitudes towards the research topics among questionnaire participants (n=37). Source: self-made, 2020.

Participants generally didn't understand RRI, but were more informed about IMC. The most notable reason for not applying for any subsidy related to RRI was the lack of opportunities, lack of knowledge about such subsidy possibilities, and lack of initiative. Most participants noted that they would apply for subsidy if they knew all the general steps to do so.

The results of the interviews only came back during the questionnaire to a limited degree. Most notably, it should be said that the innovators in the interview group had a longer, and richer experience than the questionnaire group. However, the interview group's participants assumed that this would be the result of a questionnaire. Their predictions were mostly accurate, save for the fact that better efficiency through moving on to IMC process was as prevalent as getting a lower expenditure in the budget.

In the part about RRI, participants generally showed a lacking, somewhat incorrect knowledge about RRI, and its

the participants were asked to weight the different aspects according to importance (the short description of the RRI factors was introduced in order to avoid the problem of randomised or meaningless answers). To measure the opinions on importance, Likert-scales between 1 and 5 were used. The intention of the authors was to draw conclusions about the perspective of the participants on which ones have the most notable effects on innovation processes. Results can be seen below (Chart 3).

Governance	3,56
Public commitment	3
Gender equality	3,17
Scientific education	3,92
Open access / open science	3,31
Ethics	3,61
Sustainability	3,81
Social justice / inclusion	3,11

Chart 3: Average of answers for the importance of RRI indicators among questionnaire participants (n=37). Source: self-made, 2020.

The surprising values were definitely those of public commitment and gender equality, whereas scientific education unexpectedly got a higher score overall than sustainability. This is mainly due to the specialities of Hungarian entrepreneurs – according to an earlier research of authors, the SME sector in Hungary doesn't put strong emphasis on gender equality, and don't find the connection between the SME and society as important during the actual innovation process as other nationalities. [11] Though Scientific education got very high scores overall (noteworthy is that apart from a single SME, all the others who have a relationship with universities, or research institutions mentioned before voted that it's extremely important), it is due to the high number of '5' answers, whereas

sustainability got a more balanced result, which can be considered as a proof that it's still the overall most important indicator. Below, a visual output for sustainability can be seen (Figure 2).

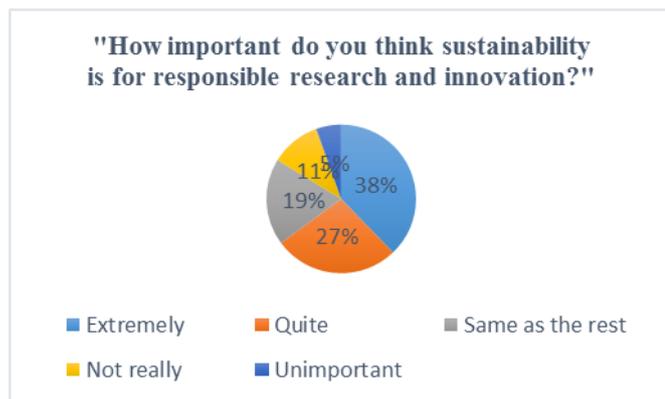


Figure 2: Answers for the importance of sustainability among questionnaire participants (n=37). Source: self-made, 2020.

Finally, using financial results from 2019, the participants were asked to give approximations (as close to real values as possible) about the returns on their marketing investment. This mainly constituted the usage of expenditures and incomes, their own measurements on marketing efficiency based on keyword searches, consumer surveys, partnership approaches, and other quantifiable sources. The results can be seen on the Figure below. (Note that the values on the Figure were rounded and normalised both in order to average out the differing values, and to remove sensitive information, however, the specific values reflect the answers of the participants.)

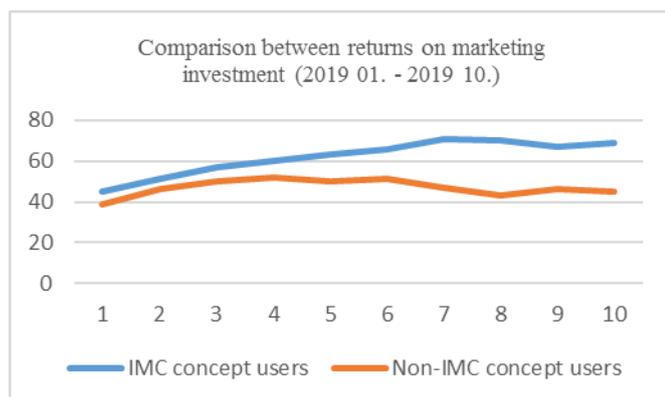


Figure 3: answers for the importance of sustainability among questionnaire participants (n=37). Source: self-made, 2020.

5. Conclusions, suggestions

Based on the research results, the Hungarian SME sector's innovative agricultural SMEs still have a lot to learn and work on in regards to the European Union's RRI concept, and its implementation. Results, however, showed that the integrated marketing communications concept is overall known and understood by the participants of the analysis. There were also results indicating that the concept is being used somewhat intuitively even in case there's no specific prior knowledge about its existence and know-how. Whereas the reliability of returns about the integrated marketing communications concept was proven by the participants – which abides by other research results of a different instance of analysis conducted by an author on the topic [15] – the RRI concept itself was hard to come by in a correctly implemented, practical sense among the participants. Results also showed that the participants have the incorrect assumptions about RRI – mainly attesting the concept to science and politics, placing less of an importance on social inclusion and commitment – which can be considered a consequence of the specifics of Hungarian society. [11] Overall, however, the results of analysing marketing-

and communications knowledge and methodology showed that using integrated marketing communications was more profitable overall when marketing innovations in the agricultural sector than standard marketing procedure, and the better results were obtained by SMEs that adhere to the concept of RRI more than those who do not. In this sense, authors state that employing an IMC approach to marketing agricultural innovations in the Hungarian SME sector is beneficial and suggested.

Authors also recommend deeper research into the communication methodology of innovation of SMEs, most notably because of its strong impact on both the SME's revenue (and financial sustainability), and because of its relation to the inclusion and commitment indicators of RRI to increase the efficiency of RRI in the Hungarian SME sector. This could open more options towards subsidy opportunities, and a stronger overall control of enterprises on the channels between them and their consumers. Innovation marketing could especially benefit from this, most notably due to the joint responsibility of innovation processes and their results shared between innovator and the society within the EU's RRI concept.

Disclaimer: in accordance with the wishes of the participants in the research, no identifiable data was left in the analysis results. Authors handled data with the confidentiality agreed upon, and hold no responsibility for any participants being identified from this document.

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