

THE NECESSITY OF INVOLVING AND EXPLOITING ALTERNATIVE ROADS IN RA AGRO-LOGISTIC SYSTEM

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Introduction

In recent years, the volume of foreign trade and turnover of the Republic of Armenia has registered a significant increase, regardless of the fact that cargo transportation is carried out mainly through one interstate road, where many problems arise throughout the year both due to severe weather conditions and drastic geopolitical changes. In this case, there is a problem of identifying and justifying the necessity of involving alternative roads in the RA agro-logistics system and the effectiveness of their use. In particular, it is proposed to use the Black Sea ports as an alternative, through which a significant amount of cargo will be transported in both directions to the Russian Federation and many European countries. Although these waterways will have a slight advantage over traditional land routes from a financial point of view, however the mentioned alternative routes will primarily solve the problems of food security in the Republic of Armenia, as well as it will open wide perspectives for both resident and foreign business entities to expand their activities.

Methodology

The problems existing in the RA agro-logistic cooperative are numerous and diverse, which are caused not only by the geographical position and geopolitical developments of the Republic of Armenia but also by the lack of diversity in the organization of cargo transportation in this field. It is needless to mention the problems that are deepening day by day and seemingly unsolvable at the border checkpoint of Upper Lars, which is now the only road connecting the Republic of Armenia to the Russian Federation and European countries. The functions of timely and safe delivery of agricultural products are very important, in particular in terms of keeping the product's term, quality characteristics and product appearance [Kurbatova, 2020, 5].

Literature review

The discovery and use of alternative routes for the foreign trade cargo transportation of the Republic of Armenia has been targeted by the Government of the Republic of Armenia since 2019. Particularly, several contracts have been signed by the Ministry of Economy of RA to exploit ferry routes from Georgian ports to Russia and in opposite direction to transport main goods from Armenia and vice versa. In recent years, a few researchers have reflected on the effectiveness of the RA cargo transportation and logistics sys-

tem. In particular, the European Bank for Reconstruction and Development analyzed multimodal transportation from Armenia, which also includes the logistics costs of goods transported through Black Sea ports. The calculations of the latter have shown that the cost of shipping by sea is much higher than that by land but they consider that even in case of high cost, uninterrupted and direct route should always be preferred [EBRD, 2023, 44-46]. Some researchers believe that the diversification of transport communications is an extremely important challenge for Armenia, as it is able to increase the level of country's logistics security and therefore can have a positive impact on the national security system [Davtyan, 2023, 323]. Director of China Center for Science and Culture (Yerevan) emphasized the importance of unblocking all transport communications in the region from the strategic point of view of economy of Armenia [Muradyan, 2023, 322]. No access to the sea, isolation, remoteness from the world markets, transit costs and other factors create serious problems for their socioeconomic development and for raising global competitiveness. Thus it is important for landlocked countries like Armenia to develop the transport infrastructure, simplify the border-crossing procedures, look for ways to gain access to markets and improve the foreign trade structure [Yeghiazaryan, 2014, 93].

Scientific novelty

In this article we have calculated the costs incurred for the cargo transportation carried out by the above-mentioned route (the cargo until it is delivered to the consumer) and made a comparative analysis with the costs of the cargo transported by water vehicles. In this case, we set out the problem of justifying the need for the involvement and operation of alternative roads for the stabilization and development of the agro-logistics system.

Analysis

From our studies, it has been found that the main circulation of RA foreign trade is carried out through the northern gate of our country, in particular through the Upper Lars checkpoints. It is well known, the transportation of Armenian goods through the mentioned section very often faces various obstacles, which are caused by climatic conditions, overcrowding of checkpoints, and the political situation. That is why there is a need to discover new alternative ways to ensure the unhindered movement of foreign trade and to strategically diversify the interstate cargo transportation carried out through the northern gate of the republic. As an alternative way, we suggest using the Black Sea ports. In particular, it is proposed to reopen the Batumi-Novorossiysk ferry route, which was in operation not long ago, through which agricultural products of Armenian production will be transported to the Russian Federation and other CIS countries and will be imported from these countries to Armenia. At the same time, it is proposed to carry out the circulation of agricultural products to European countries through the Romanian Constanta and Bulgarian Varna ports. Involvement and operation of these roads will be particularly appropriate and economically efficient in terms of carrying out the transportation of short-term consumable goods, thereby providing a quick solution to the

problems related to the export and import of perishable agricultural products. Taking into account the ongoing war situation in Ukraine, the process of delivering Armenian agricultural products to Europe and vice versa has become difficult several times. Currently, the only land road connecting the Republic of Armenia to European countries passes through Turkey, and considering the fact that the Armenian-Turkish borders are closed, our foreign trade goods enter Turkey by trucks through Georgia. The latter not only lengthens the road to Europe, but also significantly increases the cost of exported and imported goods (based on the relatively high road taxes imposed on Armenian goods in Georgia and Turkey). In this case, there is a need to search for alternative ways that will both contribute to the turnover rate of RA foreign trade and reduce the logistics costs of exported and imported goods. Ultimately, the use of new alternative routes for foreign trade will significantly reduce the loss of perishable goods during transportation and thus solve the problems of a number of business entities engaged in foreign trade in the country.

The volumes of perishable goods occupy a significant place in the foreign trade of the Republic of Armenia. The table below shows the main groups of perishable goods to be exported and imported in 2022, their volumes and monetary equivalents.

Table 1. Foreign trade of Armenia according to groups of perishable goods in 2022
(<https://armstat.am/am/?nid=777>)

Groups	Export		Import	
	Weight, tons	Million AMD	Weight, tons	Million AMD
<u>Overall</u>	187,915.1	142,449.5	206,502.3	170,561.9
Meat and meat by-products	619.9	744.4	59,151.6	44,692.7
Fish and crustaceans, minnows and other marine invertebrates	13,941.6	50,213.9	3,267.6	9,015.6
Milk and milk products, bird's eggs, natural honey and other food of animal origin	5,605.2	13,486.1	34,923.5	49,278.0
Vegetables and other edible roots and berries	65,028.3	32,485.3	58,951.3	18,985.0
Edible fruits and nuts, citrus or vegetable peels	102,437.9	45,419.9	102,382.1	43,383.6
Other products of animal origin	282.2	99.9	1,826.2	5,207.0

In 2022, the total turnover of perishable basic goods in the foreign trade of Armenia was around 395,000 tons, of which the import was the most prominent part. Each of the products included in the table has a very limited shelf life and even one day's delay in delivering these products to the consumer can lead to significant losses and deterioration of international economic relations. A vivid example of the latter is the queues of several kilometers caused by the overcrowding of the border checkpoints of Upper Lars last year, which led to the destruction of a number of fruits and vegetables of Armenian production. Based on the geographical location of Armenia, it is natural that cargo transporta-

tion related to foreign trade is carried out mainly by land routes. The fact that the majority of our foreign trade turnover is carried out with neighboring countries, particularly with the Russian Federation, Iran, Georgia and a number of EAEU and CIS countries close to the region, contributes to the latter. It should be noted that in recent years, the Russian Federation has a dominant role in the foreign trade of the Republic of Armenia, which is due to the fact that it mainly imports basic necessities with the latter. Not being a self-sufficient country, grain, meat and dairy products are mainly supplied to our country from the Russian Federation.

The geographical map of the foreign trade of Armenia is quite wide and in addition to land transportation, air, rail and water communications are also used. The communication link of foreign trade circulation with other countries and in the opposite direction is chosen based on the availability of land roads with the given country and their accessibility, taking into account the limit of customs obligations set by intermediary countries. The length of the roads, the terms of delivery of agricultural products to the consumer, the expiration date of the product and finally the cost of one unit of the product are also taken as a basis. Analyzing all the above-mentioned criteria, the business entity decides the most optimal ways of its own cargo transportation.

Table 2. Foreign trade of Armenia with different countries in 2020-2022 (million USD)
(<https://armstat.am/am/?nid=777>)

Country	Export			Import		
	2020	2021	2022	2020	2021	2022
Overall	2,536.9	3,015.9	5,419.0	4,564.0	5,362.2	8,775.8
CIS countries	744.0	930.0	2,605.3	1,686.5	2,014.3	2,888.5
Belarus	21.3	28.3	76.9	58.6	57.8	109.9
Russian Federation	680.3	840.6	2,462.7	1,477.4	1,785.4	2,637.1
Ukraine	26.4	25.6	12.7	123.7	143.2	83.9
EU countries	429.1	656.1	772.7	856.7	931.5	1,509.9
Belgium	36.5	51.9	85.7	36.2	52.9	50.9
Bulgaria	150.8	198.4	208.3	21.1	29.1	23.0
Germany	56.4	77.5	106.0	240.7	212.2	424.0
Italy	40.9	63.5	65.1	191.1	224.2	279.3
Netherlands	97.7	191.2	214.8	29.5	37.3	54.3
Other countries	1,363.4	1,429.8	2,041.0	2,020.7	2,416.3	4,377.4
USA	67.8	81.8	78.2	84.7	125.6	383.5
Iran	84.5	65.5	110.3	317.1	437.9	599.8
Switzerland	453.9	359.4	254.5	18.1	25.7	45.7
UAE	95.9	74.3	534.1	19.6	37.2	59.0
China	289.8	393.1	369.5	674.1	867.6	1,383.6
Georgia	57.4	68.3	162.4	72.9	122.0	144.2
Syria	31.2	10.9	5.6	0.36	0.73	1.1

The foreign trade turnover of the Republic of Armenia increased more than twice during the last three reporting years, which was greatly contributed by the significant increase in both export and import volumes with the CIS countries. It should also be noted that the southern gate of the republic has become more burdened in recent years, which was greatly contributed by the increase in the volume of goods turnover with neighboring Iran, the opening of new markets for our country in the United Arab Emirates and the increase in the turnover of various goods with the leading countries of Asia.

As in previous years, the Russia is considered the main partner in Armenia's foreign trade, and as of 2022, goods equivalent to more than 2.6 billion US dollars were imported from RF and goods equivalent to 2.46 billion dollars were exported to Russia. It should also be noted that the export of agricultural products in RA in 2022 was about 1.29 billion dollars, and the import to RA was about 1.37 billion dollars. In other words, in 2022, in the foreign trade turnover of the Republic of Armenia, the export of agricultural products made up 23% of the total, and the import - 15.6%.

In the foreign trade of RA, the predominant way of cargo transportation is land route, the primary explanation of which is related to financial accessibility, compared to other logistics ways. Those countries that have a land border or are connected to the Republic of Armenia through one or more countries mainly carry out trade using traditional trucks with a maximum capacity of 22 tons. In particular, as of 2022, about 2.5 million tons of goods were exported to the Russia, of which 365 thousand tons were agricultural products. Based on the latest indicators, it should be noted that in the previous reporting year, more than 18,000 trucks crossed the border of Upper Lars for the purpose of exporting agricultural products to Russia, and in the opposite direction, 717,000 tons of agricultural products were imported from Russia to Armenia through the Russian-Georgian border or about 36 thousand trucks crossed the border¹. Considering also that the only land route connecting RA with European countries and other CIS countries is the country's northern gate, the border checkpoints in Upper Lars are overcrowded almost all year round and there are often tens of kilometers of queues here. Queues of trucks at the Russian-Georgian checkpoint are explained by several circumstances. The primary one is related to the climatic conditions of Upper Lars, where for 4-5 months due to blizzards, the given section becomes difficult to pass. Here, the problem also has a political context, taking into account the recent tension in Armenian-Russian foreign relations and the new standards of products set on the Russian market, it is more difficult for Armenian products to be exported to the Russian Federation. Finally, the relatively small number of Upper Lars checkpoints, whose daily capacity cannot fully ensure the non-stop movement of Armenian trucks to the Russian Federation, also causes a problem. In this case,

¹ <https://www.armstat.am/file/doc/99541118.pdf>

the identification of new and alternative ways for the uninterrupted implementation of the foreign trade of Armenia becomes vital, which will contribute to the expansion of trade volumes with country's foreign partners, to deliver the goods to the consumer within the specified time periods, and to a certain extent will relieve the overstocking of Armenian cargo in Upper Lars. Diversification of trade routes for Armenia to Europe and CIS countries is also important from the country's strategic point of view, because in this way the dependence on cargo transportation through the Upper Lars checkpoints will be reduced and considering the fact that our country is not self-sufficient in food, the use of alternative routes will also help to avoid from possible food disasters.

In recent years, various decisions have been made by the Government of Armenia with Georgian and Russian partners to use ferries operated by foreign operators using the Black Sea ports. For this purpose, the RA government has also included decisions related to RA external communications in the 2021-2026 activity plan¹. In particular, by the decision of the Government No. 644-L of May 5, 2022, a contract was signed to ensure cargo transportation by ferry of RA resident organizations exporting goods from the territory of Armenia or importing goods to the territory of Armenia. The decision was planning to provide at least one and at most twice a week flights in the direction of Poti-Caucasus-Poti ports². With this decision, it was planned to fully compensate RA resident organizations for transportation costs by ferry, and to charge non-resident organizations 1.2 million drams for one truck flight, and 1.5 million drams for one railway wagon flight.

It should also be noted that the scheduled ferries, which were to be leased to Armenia by the Russian operator "C&M International", were supposed to accommodate 40 wagons and 50 trucks. The RA Ministry of Economy also calculated that the cost of one Poti-Caucasus-Poti flight would be 120 million drams and would be subsidized from the RA state budget. However, the use of ferries as an alternative transportation route was not implemented until August 2023 and the reasons for not being implemented were several. First of all, the problem was that the operator of the port of Poti in Georgia, APM, is a Dutch company, which in turn prohibited the entry of Russian ships to the port of Poti, based on the sanctions imposed against the Russian Federation. Another problem was the insufficient amount of goods exported from Armenia, due to which the cost of transporting half-empty ferries from Poti to the port of Caucasus was not justified.

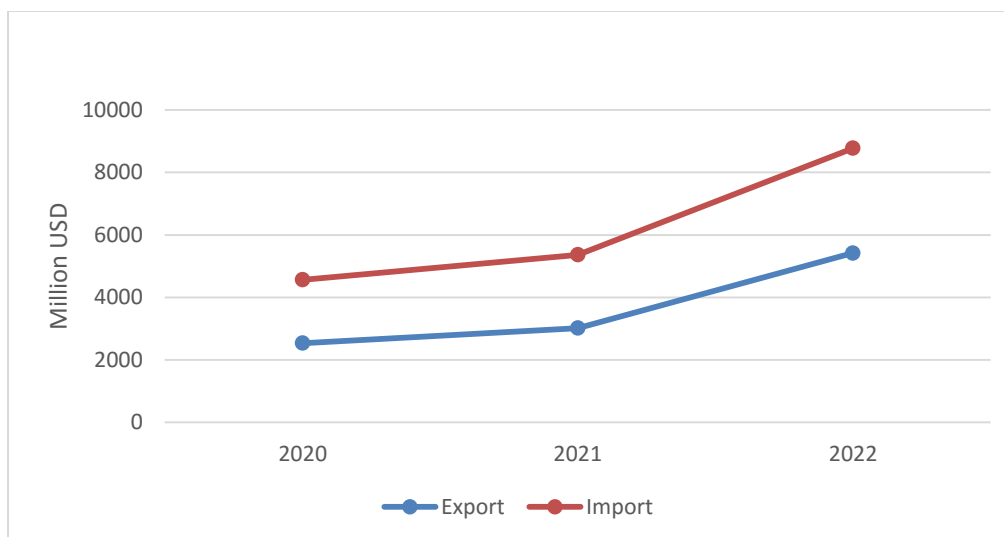
In the period from June 1 to August 31, 2023, the leased ferries were finally put into operation for the first time, but the Batumi-Novorossiysk line was used instead of Poti-Caucasus port, whose freight costs were almost the same as those calculated in previous years. However, after carrying out several cargo transportations by ferries, the Ministry

¹ <https://www.arlis.am/DocumentView.aspx?docID=158031>

² <https://www.arlis.am/DocumentView.aspx?DocID=162694>

of Economy announced that in the future, ferry transportations will no longer be used. The Ministry, giving a general justification, admitted that ferry transportation as an alternative was not justified both financially and from the point of view of ensuring the movement of ferries. The agro-logistic system of the Republic of Armenia still has all the above-mentioned problems, the quick solutions of which and reforms in the system will absolutely promote the expansion of the country's foreign trade circulation and will make the foreign trade relations with our country more attractive for the business entities of the importing countries to Armenia. Analyzing the Table 1 presented in the article with the help of the figure below, it becomes obvious that the dynamics of RA foreign trade in the course of the last 3 reporting years is very positive. In particular, in 2022, the volumes of both exports from Armenia and imports to Armenia doubled compared to 2020.

Figure 1. The dynamics of Armenia’s foreign trade



For this purpose, it is proposed as an alternative way to restore the previously existing Batumi-Novorossiysk ferry route, which will allow to primarily transport cargoes of Armenian production to the countryside and will operate in the opposite direction for importers to Armenia. Taking into account that only about 20% of the foreign trade of Armenia belongs to the trade circulation of goods of rural significance, it is obvious that goods belonging to other important sectors should also be transported by ferry.

The volumes of the main part of the foreign trade will be required to operate the ferries in both directions with uninterrupted schedules throughout the year, thus the finances invested from the RA state budget will also be justified in the course of time. However, it should also be taken into account that the re-opening ferry alternative road in the near future cannot fully justify the costs incurred for the project and ensure the uninterrupted

movement of ferries at once. It will take some time for RA resident and non-resident business entities engaged in foreign trade to benefit from proposed alternative route compared to the Upper Lars cargo transportation, both in terms of finances and time.

Thus, in order to exploit the proposed Batumi-Novorossiysk ferry route in the near future, it is necessary to rent the ships of the Russian-made "C&M International" operator, which will operate once a week in both directions in the first months of operation, and then they will be operated twice a week according to the schedule. As already mentioned, the ferries offered by the Russian operator accommodate 40 wagons and 50 trucks and the rental costs for 1 flight in both directions are 120 million drams. The mentioned logistics costs, as defined in the plan signed in 2022, must now also be fully subsidized by the state¹. Thus, the capacity of the ferries offered by the above-mentioned operator will allow moving more than 9,000 trucks and 7,000 wagons in both directions annually.

In line with the re-opening of the waterway operation, contracts should also be signed between "South Caucasian Railways" (hereinafter "SCR") CJSC and "Russian Railways" OJSC, through which the schedules for the transportation of wagons to Georgia and on the other side to the port of Novorossiysk will be agreed with the operator. Based on the "SCR" tariff policy for the freight year of 2023, the reduction of the rate of transportation fees for grain cargoes on behalf of the Republic of Armenia will help, first of all, to reduce the transportation price of grain imported from the Russian Federation and from a strategic point of view, it will promote the solution of the problem of food security in Armenia².

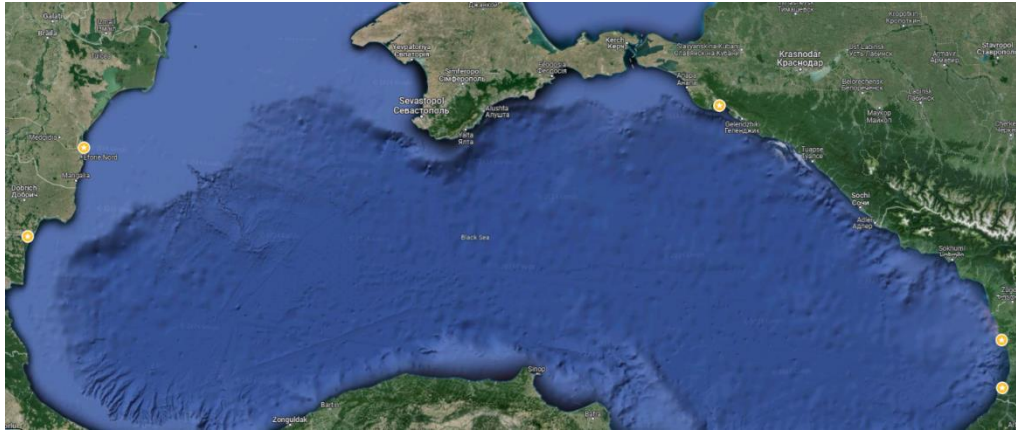
As noted due to the Russian-Ukrainian war, which has been going on for more than 2 years, it has become very difficult to carry out cargo transportation from the Republic of Armenia to European countries and vice versa. The problem lies in the fact that before the war, RA carried out its foreign trade with Europe using the land routes of Russia and Ukraine, which provided access to the European market. Now, taking into account the political situation of Ukraine, the ports of the country (including Odesa, Ilyichovsk, Mariupol) and land roads from the east are closed (Bandura et al., 2024). However, in order to export to Ukraine, the Black Sea countries use the Romanian Constanta and the Bulgarian Varna ports for cargo transportation. In particular, the capacity of the Poti-Constanta ferry has increased³. This circumstance creates favorable conditions for the Republic of Armenia to rent Georgian or European ferries, which will transport Armenian rural products to Ukraine and a number of European countries and import them in the opposite direction at significantly low rates.

¹ <https://www.arlis.am/DocumentView.aspx?docid=178365>

² <https://www.railway.am/ctu/armdocuments>

³ <https://plaske.ua/ferry-constant-poti-constant/en>

Map 1. Sea ports for cargo transportation



In the above map, the ports of Poti and Batumi in Georgia, Novorossiysk in Russia, Constanta in Romania and Varna in Bulgaria are distinguished as alternative waterways in RA foreign trade. In particular, the Batumi-Novorosiysk ferry route, whose one-way cargo transportation times will last 2-3 days, will be appropriate for transporting RA products to various regions of the Russian Federation and other EAEU member countries, up to Central Asian countries and in the opposite direction. According to the calculation, the average cost of 1 truck from the Republic of Armenia to the ports of Batumi or Poti will be 250 thousand AMD, and the cost of the ferry from the port of Batumi to Novorossiysk will vary from 600 thousand to 800 thousand AMD. Thus, it can be stated that, according to the calculation, ferry transportation costs will increase the total freight costs by around 20%, but will allow the goods to be delivered to the consumer a few days earlier. This fact will be of more importance for economic entities involved in the export and import of agricultural products, which will no longer have to dispose of perishable products for which special terms and storage conditions are specified according to international norms. At the same time, the use of ferries in RA foreign trade will primarily be used for the transportation of grain cargoes and will seamlessly reduce the dependence on cargo transportation across the Russian-Georgian land border.

On the other hand, using the European Black Sea ports, both the cost and time of cargo transportation by ferries will be doubled compared to the Batumi-Novorosiysk ferry route. However, in this case, the expenses will be justified first of all from a point of view of time and will make the trade circulation with the Republic of Armenia more attractive for the European partners. In this case, it should be planned that the schedule of the Poti-Constanta or Poti-Varna ferry route will operate every two weeks or at most once a week, as only 20% of RA's foreign trade goes to European markets.

It should also be taken into account that the costs of carrying out shipping on the specified waterway will be completely different when the Republic of Armenia acquires its own ferries. After studying the market, it became clear that one ferry, the capacity of which is 50 trucks and 40 wagons, will cost around 10 million USD¹. Taking into account the volume of foreign trade of the Republic of Armenia, it is recommended to purchase 2 similar ferries in the initial part of the use of alternative routes. It is also suggested that most of the cost of purchasing ferries, up to 70%, should be done on a share basis and only 20-30% should be allocated from the RA state budget. At the same time, such a policy will increase competitiveness in the RA stock market, and taking into account the rate of growth of RA foreign trade turnover in recent years, it can be assumed that this initiative will have the opportunity to compete with other large joint-stock companies in the RA stock exchange and expand its volumes.

Conclusion

Thus, it can be confirmed that the use of alternative ways in the agro-logistic system of the Republic of Armenia will be of vital importance in the development of foreign trade of the Republic of Armenia. In particular, using the Black Sea ports, carrying out cargo transportation by water will fundamentally reduce the tens of kilometers of queues that constantly arise at the Upper Lars checkpoints and will stimulate the expansion of the production volumes of RA resident business entities. The exploitation of alternative roads will also make foreign trade relations with the Republic of Armenia more attractive and will significantly increase the volume of imports of primary goods to the Republic of Armenia. Since the northern gate of the Republic of Armenia accounts for the “lion's share” of the country's foreign trade volumes and currently cargo transportation in that direction is carried out only through the Georgian-Russian land route, the involvement and exploitation of alternative roads is also important from the point of view of strategic importance for our country. Diversification of interstate roads will keep the Republic of Armenia away from possible food disasters and ensure the uninterrupted movement of essential goods.

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Key words: agro-logistics, ferry, alternative roads, foreign trade, port

The problems existing in the RA agro-logistic system are numerous and diverse, which are caused not only by the geographical position and geopolitical developments of the Republic of Armenia, but also by the lack of diversity in the organization of cargo transportation in this field. Taking into account that in the total volume of cargo transportation of the country, road transport makes up more than 70% in 2022, the identification and exploitation of optimal alternative roads is more than important. In this article, it is proposed to use the Black Sea ports as an alternative, through which a significant amount of cargo will be transported in both directions to the Russian Federation and a number of European countries. Although these waterways will be inferior to traditional land routes from a financial point of view, the mentioned alternative routes will primarily solve the food security problems of RA, as well as open up wide perspectives for both resident and foreign business entities to expand their scope of activities.