



Productive Works in Greece :

Land Reclamation and Settlement in Macedonia

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Readers of the International Labour Review are already familiar with the resolution adopted by the Eighteenth Session of the Conference requesting the Governing Body to ask the Office for periodical reports on the measures taken or proposed in different countries on the subject of public works, with special reference to their possible effects on employment. In connection with this resolution the following article will be read with interest. In it the author describes in turn the various aspects—technical, social, financial, and economic—of an important scheme for the reclamation and improvement of an area of about four hundred square miles of low-lying land in Macedonia and Thrace, and the measures taken to develop it, not only as a means of promoting national economic development, but primarily for the social purposes of relieving overcrowding in the towns, enlarging the inadequate holdings of the peasants, and generally improving the conditions of living in the country.

THE valleys of Salonica and Seres in Macedonia had long suffered from vast floods caused by the waters of the Rivers Axion, Aliakmon, and Strumon which flow through them and by a number of other mountain streams. In more recent years, and particularly during the melting of the snows, owing to the torrential nature of these rivers and the fact that their beds were gradually filled up with large deposits of loose material, considerable areas were rendered useless for cultivation by the constant shifting of the river beds, and hundreds of thousands of stremmas¹ were periodically inundated by their

¹ 1 stremma = 10 ares = 0.247 acre.

flood-waters, which destroyed cultivation and formed extensive fever-breeding swamps constituting a very grave danger to the local population.

In the course of time the inhabitants of these valleys grew tired of devoting money and labour to the cultivation of land exposed to almost certain danger, and confined themselves to farming small areas entirely inadequate for their support, abandoning those where the risk of flood was greatest. Of the latter type of land, only a small section was planted with spring crops in years when the danger of flood passed over in time, the remaining and major portion being given over to pasture.

This situation was unsatisfactory enough for the established indigenous population, but it became wholly intolerable after the establishment of refugee communities in closely planted settlements throughout the district. After the disastrous events of 1922 in Asia Minor and the exchange of populations between Greece and Turkey which followed them, the Greek Government, although fully aware of the conditions just described, nevertheless found itself obliged, in order to check the influx of still more refugees of a definitely rural type into the already overcrowded urban centres, to settle thousands of families on land which was not only extremely unhealthy but also of doubtful productivity. In order to avoid creating an extremely serious social problem, however, it thereby tacitly accepted the obligation to put in hand the necessary hydraulic works without delay. It was thus the need to improve sanitary conditions, to protect the flooded areas, to extend the inadequate holdings granted to both the indigenous farmers and the refugee settlers by reclaiming fresh land, and to relieve the pressure of population in the overcrowded urban centres, that made it imperative for the State to undertake the schemes of hydraulic works in the valleys of Salonica and Seres.

In considering the productive works in Macedonia, therefore, and in discussing the methods adopted for the disposal and exploitation of the reclaimed lands, it is essential to bear in mind that the schemes were inspired primarily by considerations of public utility and the improvement of national economic conditions, rather than by the expectation of their furnishing a satisfactory direct return on the invested capital.

DESCRIPTION OF THE SCHEMES

The scheme of works in the Salonica valley comprises the following operations :

- (1) draining Lakes Artzan and Amatovo by constructing a canal to evacuate their waters into the River Axios ;
- (2) correcting the banks of the Rivers Aliakmon, Axios, and Galikos, so as to protect the land in the valley from flood ;
- (3) draining Lake Yanitsa and the marshy area along the course of the River Loudia by constructing a peripheral canal to collect and discharge into the Aliakmon the waters of the mountain streams and of the River Boda, which now flow into Lake Yanitsa, and by deepening and widening the bed of the Loudia which discharges the waters of Lake Yanitsa into the sea ;
- (4) diverting the mouth of the Axios towards the extremity of the Gulf of Salonica in order to prevent the silting up of the harbour of Salonica ;
- (5) irrigating the largest possible area of the lands protected and drained as a result of the foregoing schemes.

The works in the Seres valley aim at :

- (1) protecting the land in the valley against flooding by the mountain streams and by the River Strumon by diverting and deepening the latter's bed throughout its course ;
- (2) draining Lake Achinos and the marshy areas in the valley ;
- (3) correcting the banks of the various mountain streams ;
- (4) irrigating the land in the valley by means of the River Strumon and the newly formed storage lake of Kerkina, which is to serve on the one hand as a deposit for the material brought down by the streams, and on the other as a reservoir for the irrigation of the land during the summer.

The firm which has been granted the contract for the schemes in the Seres Valley has also been entrusted with the task of draining the marshes of Philippi in the valley of Drama and protecting the lands subject to inundation by the various mountain streams.

As a result of the execution of the schemes described as briefly as possible below, the following areas of reclaimed land will become available :

(1) *Valley of Salonica :*

	Stremmas
Draining of Lakes Artzan and Amatovo, representing a total area of 48,500 stremmas	46,500
Draining of Lake Yanitsa and the Loudia marshes	297,000
Draining of marshy areas around the former mouth of the Axios	39,000
Total	382,500

Deducting from this figure, which represents the total area of the land to be reclaimed, 28,500 stremmas (8,500 in the Artzan and Amatovo areas and 20,000 around the present mouths of the Axios and Loudia) which consist of salt-bearing and sandy soil and are therefore unsuitable for cultivation, and estimating at 10 per cent. or 35,000 stremmas the area to be occupied by the remaining works (drainage system and roads), some 319,000 stremmas of new land will remain available for cultivation.

The works will also safeguard a further area of 300,000 stremmas against flood.

(2) *Valleys of Seres and Drama :*

	Stremmas
Draining of Lake Achinos	115,000
Draining of marshes	232,000
Draining of the Philippi marshes	90,000
Total	437,000

Again deducting from this figure the 10 per cent. which the additional works and roads may be expected to occupy, the new area made available for cultivation will amount to 394,000 stremmas.

The area protected from flood in these valleys may be roughly estimated at a further 300,000 stremmas.

These schemes would have been incomplete and unable to fulfil their objects of increasing the size of the peasants' holdings and relieving overcrowding in the towns, had not measures simultaneously been taken to provide for the irrigation of wide areas in the valleys of Salonica, Seres, and Drama. The plans for the Seres valley provide for the irrigation of 444,000 stremmas of land. Those for the other two valleys have not yet been established, but it is expected that they will cover 200,000 stremmas in the Drama valley and 800,000 in the Salonica valley. The latter area is to be irrigated by means of the Rivers Aliakmon, Axios, and Boda and Lake Doiran, as well as from various minor sources. As, however, it is not yet known whether the plans will take into account the full volume of the River Axios, which

before entering Greece flows through part of the neighbouring territory of Serbia and may therefore be used by that country, or whether the irrigation of the whole of the Salonica area will repay the heavy expense involved, it is probably wiser to take as the basis of our estimate a figure of 400,000 stremmas as more nearly approaching the truth.

According to the foregoing calculations, therefore, the schemes as a whole will have the following results :

Areas made available for cultivation by the	Stremmas
draining of lakes and marshes	713,000
Flood protection	600,000
Irrigation	1,044,000

The schemes already executed have provided flood protection for all the above-mentioned areas and made available for cultivation 440,000 stremmas of land reclaimed from lakes and marshes as follows :

	Stremmas
Artzan and Amatovo	33,000
Loudia	35,000
Yanitsa	120,000
Seres	232,000
Total	440,000

COST OF THE SCHEMES

Wishing to put these schemes in hand at the earliest possible date, and unable to meet their cost out of its budget, the Greek Government found itself obliged to have recourse to foreign loans. These loans, issued in 1928 and 1931 at 82 and 84 per cent. respectively, bear interest at the rate of 6 per cent. and are repayable within 40 years. They amounted to £4,000,000 and £1,600,000 sterling respectively.

The funds provided by these loans served to finance not only the hydraulic works, which were allotted a sum of £3,833,538, but also the road-building schemes which were initiated on a wide scale at the same time, and the newly-founded Land Bank of Greece.

As the necessary technical staff was not available in Greece, the contracts for the schemes were given to foreign firms, namely, the Foundation Company of New York for the Salonica valley, and John Monks and Sons and the Ulen Company for the Seres and Drama valleys. These firms undertook to plan and carry out the schemes in accordance with estimates of their cost.

The probable cost of the schemes in the Salonica valley was estimated at \$33,962,000, and of those in the Seres and Drama valleys at \$20,882,000.

To-day, on the basis of later and more accurate estimates and in view of the altered economic conditions, the total cost is expected to amount to \$18,000,000 for the Salonica valley and \$16,000,000 for the Seres and Drama valleys, making \$34,000,000 in all. From this sum, however, may be deducted about \$420,000, which represents the estimated cost of the scheme for diverting the river Axios and which cannot reasonably be included in the charges on the land itself, since it is intended not to improve the land but to protect the harbour of Salonica. Hence the total expenditure on the land is reduced to \$33,580,000.

Of the loans issued in 1928 and 1931 a total of £3,833,538 had been allotted to the hydraulic works up to 1932. Unfortunately, however, the ensuing economic depression and the consequent inability of Greece to obtain on foreign markets the funds necessary to pay the companies threw the national authorities onto their own resources; as it was impossible to find the whole of the annual sums required in the budget, it became necessary to slow down the tempo of the works and make their completion depend on budget possibilities. The sums so far allotted to these schemes are 329 million drachmas in 1932-33, 288 million in 1933-34, and 250 million in 1934-35.

The completion of the hydraulic works themselves will not, however, represent the end of State expenditure on the schemes. It is obvious that land which has been under water for centuries, like that of Lakes Yanitsa and Achinos and the Philippi marshes, will need further preparation to make it fit for use, entailing further and not inconsiderable expenditure.

From this standpoint the reclaimed lands may be divided into three categories: (a) land which may immediately be put into cultivation and rendered productive by the ordinary methods of farming; (b) land which cannot be cultivated before being cleared of reeds and prepared by methods which are not within the peasants' scope (caterpillar tractors and special ploughs); (c) lands where natural conditions must be improved by constructing a close network of drains, clearing, and repeated ploughing by tractors.

The first category comprises the marshy areas of the Seres valley and small sections of the outer zone of Lakes Yanitsa and Achinos and of the marshy districts of the Loudia and Philippi,

making an area of about 263,000 stremmas in all, distributed as follows :

	Stremmas
Seres	210,000
Philippi	18,000
Achinos	10,000
Loudia	15,000
Yanitsa	10,000
Total	263,000

The second category includes the beds of Lakes Artzan and Amatovo, and the remainder of the marshes of the Loudia and of the outer zone of Lakes Yanitsa and Achinos, making a total area of about 188,000 stremmas distributed as follows :

	Stremmas
Artzan and Amatovo	33,000
Loudia	40,000
Achinos	15,000
Yanitsa	100,000
Total	188,000

The third category comprises the inner zone and centre of Lake Yanitsa and probably also Lake Achinos and the Philippi marshes, making 262,000 stremmas in all. These lands, which formed the lowest part of the lakes and are for the most part covered by a thick layer of peat, will require the construction of a close triple system of drains to facilitate the rapid evacuation of their waters, harrowing to a considerable depth by mechanical means in order to mix the subsoil with the organic substances, and repeated working over of the soil to eradicate weeds and rushes and open it up to the action of the air. Lastly, the whole area will have to be provided with the necessary network of roads.

It is thus evident from what has been said that although fortunately the major part of the new lands is either ready for immediate cultivation or needs comparatively little expenditure on improvement, there are also areas of considerable extent which cannot be made productive without further economic sacrifices on the part of the State.

As these areas have only recently been uncovered, and as the secondary drainage system has not yet been constructed nor a survey of the land carried out, it is impossible at this stage to estimate with any degree of accuracy the additional expenditure

required. A tentative estimate of the cost of the supplementary schemes for surface drainage, road making, and land improvement may however be made on the following lines.

As the secondary drains, the cost of which is included in the figures given above (expenditure of the Foundation and Ulen Companies), are to be constructed so as to discharge at distances of 1 kilometre apart into the main drainage system, it may be estimated that the third series evacuating into them will have to be constructed at average intervals of 250 metres. These drainage ditches will have an average depth of 1 metre and will be trapezoid in section ; the volume to be excavated on each strip of 250 stremmas (250 metres wide by 1,000 metres long) will be 1,750 cubic metres, representing a cost of 70 drachmas per stremma (at a rate of 10 drachmas per cubic metre).

As regards the road system, it may be reckoned that each strip of 250 stremmas will be served by two roads, one along each side of the secondary drains, making a total length of 500 metres.

The building of this network of secondary rural roads, carried out by machinery of the grader type by the State Service for Mechanical Cultivation, will cost about 2,500 drachmas for every kilometre of road 6 metres wide. This of course assumes that the roads will be without any kind of surfacing and will require constant maintenance. The cost of these secondary roads will amount to 5 drachmas per stremma ; to this must be added the cost of building two crossings in each strip of 250 stremmas over the third series of drains, at a probable cost of 5,000 drachmas each, or 40 drachmas per stremma.

Apart from these secondary roads it will also be necessary to provide for the construction of main roads with a semi-permanent surface to link up the most important agricultural centres along the borders of the lakes in practically straight lines running through the former lake beds. The length of these main roads may be reckoned at 100 kilometres for Lake Yanitsa and 10 kilometres for Lake Achinos. They will not be necessary for the other lakes and marshy districts, which cover scattered and comparatively small areas or are divided into narrow strips and can therefore be served by the existing rural roads.

These roads will cost about 250,000 drachmas per kilometre, to which must be added the cost of six bridges at about 1,000,000 drachmas each—four over the main drains for Lake Yanitsa, one over the Loudia, and one over the Strumon. Thus the total cost

of these works will amount to 33,500,000 drachmas, or 47 drachmas per stremma for the whole drained area of 713,000 stremmas.

Lastly, the land will require the following clearing and improvement operations, the cost of which will constitute a further burden on the State.

The land belonging to the first category (263,000 stremmas) has already been cleared for cultivation by the neighbouring farmers and does not call for any further State expenditure.

The second zone of land will require the following operations, carried out by means of the caterpillar tractors owned by the State Service for Mechanical Cultivation : (a) harrowing to a depth of 30 centimetres in order to stir up the organic substances and mix them with the subsoil, at a cost of 90 drachmas per stremma ; (b) ploughing with a view to further mixing the soil and subsoil and exposing them to the action of the air, at a cost of 75 drachmas per stremma ; (c) treatment with disk harrows and cultivators in order to break up and level the ground, at a cost of 40 drachmas per stremma.

All these operations together will require an expenditure of 205 drachmas per stremma, or 38,500,000 drachmas for the total area of 188,000 stremmas in the second zone.

The third zone will require, in addition to the foregoing operations, a third ploughing also costing 75 drachmas per stremma, and an extra treatment with the disk harrow, since this land needs more extensive working and aerating and further ploughing to clear it of weeds, rushes, turf, etc.

The cost of improvement per stremma for this zone will amount to 320 drachmas, or 83,800,000 drachmas for the whole area of 262,000 stremmas.

On this basis, therefore, the average cost of improving the whole drained area of 713,000 stremmas will amount to 171 drachmas per stremma.

For the whole area of 713,000 stremmas the average cost per stremma of the supplementary works which will have to be effected at the expense of the State may thus be summed up as follows :

	Drachmas
Third series of drains	70
Secondary network of roads with crossings	45
Main roads with six bridges	47
Ploughing and improvement	171
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Average cost per stremma	333

As regards the third series of drains especially, it is true that over a great part of the area (e.g. the Loudia district, the marshes in the Seres valley) these will need to be much less close together than is allowed for in the foregoing estimate; against this, however, they will probably have to be closer in certain particularly damp regions, such as the lower ground at the centre of the lakes. As other work on the soil, such as levelling and excavating, will also probably be needed, the above estimate of 115 drachmas per stremma for the third series of drains and the secondary roads, averaged over the whole extent of 713,000 stremmas, may be taken as approximately correct.

The aggregate cost of all supplementary work, including drainage, road making, and the improvement of the reclaimed land, will therefore amount for the whole area to 237,400,000 drachmas ($713,000 \times 333$). Apart from this amount, however, the State will also have to find funds for the building of new settlements to house families now living in the towns, a point which will be dealt with more fully below in discussing the disposal of the land.

The net area available for settlement will be 195,000 stremmas, on which it will be possible to establish 3,900 new families.

Taking the cost of building a homestead consisting of two rooms, a stable, and a barn at 35,000 drachmas and allowing 20,000 drachmas for the purchase of farm equipment (a plough, a harrow, two animals, and one vehicle) for each family, the expenditure required for the 3,900 families will be 214,500,000 drachmas. To this must be added a further sum of 30,000,000 drachmas in all for the provision of a water supply, the building of schools and churches, and other public utility work for the score or so of settlements to be established, the total cost of which will therefore amount to 244,500,000 drachmas.

It should be noted that these estimates do not include the cost of the first year's cultivation, sowing, reaping, threshing, etc., since this is to be undertaken by the State Service for Mechanical Cultivation with its own machinery, the cost being deducted from the first harvest. Similarly, no allowance is made for the maintenance of the families during the first year, since it is proposed to install them in the new settlements at the harvest season.

As will be seen below, the remaining land is to be distributed among the neighbouring settlements, so that the State will not be called upon to make any contribution towards installation.

Taking into account the above expenditure on supplementary works, which amounts to 482,000,000 drachmas (237,400,000 + 244,500,000), and adding the 3,723,500,000 drachmas already spent on the schemes or required for their completion, the aggregate cost of the whole enterprise will thus amount to 4,205,500,000 drachmas.

METHODS OF DISPOSAL AND EXPLOITATION OF THE NEW LANDS

In view of the great national importance of these productive works, it was only natural that the methods of their disposal and exploitation should be eagerly discussed by all who were competent to express an opinion, and in particular by economic and technical circles. Studies, memoranda, and lectures were used to bring to the Government's notice the solutions regarded in various quarters as likely to ensure the successful exploitation of the new lands. Some of these proposed the setting up of an autonomous State organ, with the co-operation of the banks, which should cultivate and improve the land during the first few years and later hand it over to the peasants on specified terms. Others recommended that the land should be ceded to companies which would also undertake to transfer it gradually to the peasants designated by the Government. These suggestions, which were based on the principle that the exploitation of the lands should be treated as a purely economic enterprise, and aimed at relieving the State of further expense while ensuring more thorough improvement of the soil, undoubtedly offered many advantages; but they would have postponed the final settlement of the peasants for at least ten years.

In order to appreciate the full significance of this drawback, it must be remembered that while Macedonia was under Turkish rule and for some years afterwards the land in these valleys, with very minor exceptions, had been concentrated in the hands of a number of Turkish and Greek landowners, and formed large estates (*chiftliks*) cultivated on the share-farming system. In 1917, anticipating the long-smouldering rising of the peasants and the impossibility of quelling it with the aid of the soldiers, who were about to return to their homes, and wishing also to make every peasant cultivating the land the owner of a family holding (i.e. sufficient to support himself and his family), the Government passed the first legislative measures to break up the large estates

throughout Greece. While the war continued it was impossible to apply these laws in Macedonia, where the situation consequently remained unchanged until 1922, after certain provisional measures had been taken to safeguard the tenure and rights of cultivation of the share-farmers. The exchange of populations which followed the collapse of the Asia Minor front in that year created a new situation in Macedonia, making it necessary temporarily to set aside the provisions of the Agrarian Act which, as just indicated, expropriated the large estates and provided that all the peasants settled on them should be granted a parcel of land sufficient to support them.

When it is recalled that in place of the 200,000 Turks who left Macedonia there flowed into it 430,000 peasant refugees, it will readily be understood that the new situation thus created made it imperative to set aside the principle of the family holding and to make immediate provision for the new arrivals. This could not be done save at the expense of the old or recently established smallholders, whether these were former local share-farmers or refugee settlers. Hence villages which formerly accommodated 100 Turkish families were now made to hold 130 to 150 refugee households, and the total number of share-farmers and refugees settled on the big expropriated estates was often more than double what the land could adequately support.

The result of this situation was to restrict the average peasant holding to an area of between 30 and 35 stremmas, and it was even not uncommon for holdings of 16, 18, or 20 stremmas to be granted, an area totally inadequate to enable any small farming enterprise of the type prevailing in Macedonia to be successfully carried on.

Hence, in deciding how to distribute and exploit the reclaimed lands, two alternatives were open to the State. It could either ignore the existing situation, postpone until a more favourable juncture the satisfaction of the rightful claims of the peasants, who had endured these conditions for ten years and were persistently demanding the extension of their holdings, and cede the land to an autonomous public body or company with a view to ensuring its improvement without cost to the State; or it could proceed immediately to distribute the lands, itself assuming financial responsibility for any improvement required. Ultimately, after wavering for some time between these two solutions, the social aspect of the problem was allowed to predominate, and it was decided to distribute the land among the peasants immediately.

It may be pointed out that this solution was perfectly practicable, since, as already stated, about half the reclaimed land was either ready for immediate cultivation or required only a minimum of expenditure to make it so.

The Act issued in this connection, No. 5783 of 26 June 1933, and the Legislative Decree of 23 February 1934, provided for the disposal and exploitation of the land reclaimed by the drainage schemes in Macedonia, and laid down the terms on which they were to be ceded to the peasants.

The most important provisions of these measures are as follows :

(a) The villages on the borders and in the vicinity of the works are granted the areas necessary to complete their holdings, which must not, however, exceed 50 stremmas of non-irrigated or 40 stremmas of irrigated land.

(b) Payment is to be made for the extra land granted ; the price may not exceed the cost of the works for the corresponding area, and if this is considered excessive it may be reduced by not more than half. This last provision was rendered necessary by the fact that the productivity of the reclaimed lands varies, so that it would have been unfair to fix the same price for every holding. The holders of these extra parcels are to pay for them in kind at the rate of 20 per cent. of spring crops and 25 per cent. of autumn crops.

(c) Until the final determination of the claimants to the land and of the exact areas to be granted, the peasants working the land are required to pay in lieu of rent a share of their produce varying from 20 to 40 per cent. according to the nature of the crop and the cost to the State of clearing the land.

(d) The holdings must be cultivated systematically and by the owners themselves, who are required to conform with the instructions of the Agricultural Service on pain of forfeiting their holding.

The effect of the application of this Act will be to distribute all the reclaimed lands among the inhabitants of the neighbouring villages whose agricultural holdings are incomplete, with the exception of 10,000 stremmas reclaimed from Lakes Artzan and Amatovo, and the beds of Lakes Achinos (115,000 stremmas) and the Philippi marshes (90,000 stremmas), these areas being

reserved for the surplus population of the towns of Seres, Drama, Kavalla and Xanthe.

In these towns, which of late years have become important centres of the tobacco trade, over-population and an over-supply of labour have created a situation which is nothing short of tragic. The population of the towns before the arrival of the refugees was : Seres, 14,520 ; Drama, 16,700 ; Kavalla, 23,000 ; and Xanthe, 16,580. By 1928 these figures had more than doubled, the figures for that year being as follows : Seres, 29,620 ; Drama, 32,200 ; Kavalla, 50,000 ; and Xanthe, 36,000. Up to 1922 the whole of the population was employed in exclusively urban trades which supplied the needs of the surrounding countryside, while workers from neighbouring agricultural communities were taken on to work in the cigarette factories during the slack season in agriculture. With the growth of the population of the towns, however, and owing to the abundance of labour available, a special occupational group of cigarette workers has grown up which works at certain seasons only, and is supported for the rest of the year by State relief. This class of workers, which has been organised for many years, not only handicaps the tobacco trade very seriously by the constant pressure it exercises to obtain wages higher than the industry can bear, but has the further disadvantage of depriving poor mountain communities of a source of gain that was essential to their livelihood. These are the conditions which the measures to thin out the population of these towns were intended to relieve.

It is obvious that the distribution of the new lands on the principle described above neither completely remedies the inadequacy of peasant holdings due to the settlement of the refugees in Macedonia, nor fully solves the problem of overcrowding in the towns. Any other scheme aiming at a more general improvement of conditions in Macedonia would, however, have been impracticable in view of the present restricted economic resources of the State, and would also have met with insuperable difficulties in its application. The fact that the reclaimed lands have been granted to the settlements nearest to them does not, of course, mean that there are not other rural communities whose need is even greater than that of many of the new beneficiaries. But to have transferred peasants from distant parts of Macedonia would not only have entailed further national expenditure ; it would inevitably have led to disturbances among the local com-

munities who have suffered for years from the proximity of the unhealthy marshes, and, having been prevented from prospering by the inadequacy of their holdings, have been sustained by the sole hope of having these enlarged out of the new lands. Moreover, a more general thinning out of the rural population throughout Macedonia, with a view to increasing the size of the present holdings, would not have made sufficient improvement in the position to justify the very heavy expenditure involved. These considerations, in addition to the unavoidable necessity of enlarging the neighbouring holdings, led to the decision to settle cigarette workers on the land, a solution which satisfies more immediate and imperative social needs. It is obvious that to entrust the cultivation of the new lands to cigarette workers who, although coming for the most part from peasant stock, have only an inadequate knowledge of agricultural methods, is not the best way to obtain the largest possible yield from the new lands and to increase the national income. Nevertheless, as has repeatedly been emphasised above, the urgency of the social aspect of the problem overshadowed considerations of economic and social policy, and left the State with no alternative but to settle the cigarette workers on the part of the reclaimed land remaining available, which was no less than a godsend to it in the circumstances.

According to the particulars given above, of the 819,500 stremmas of new land, 604,500 are to be granted to the population of the neighbouring settlements and 215,000 to cigarette workers from the towns.

Of these lands, the following areas have already been granted provisionally :

(a) Lakes Yanitsa, Loudia, Artzan, and Amatovo, 235,000 stremmas, to peasants in the neighbourhood. Parts of this area have already been put under cultivation and have given satisfactory results during the current farming year ; most of it, however, cannot yet be cultivated because the secondary drainage system has not yet been constructed and it is therefore still extremely damp.

(b) Lakes Artzan and Amatovo : 11,000 stremmas, distributed among 200 cigarette workers' families from Kavalla.

(c) The marshy areas in the Seres valley extending over 232,000 stremmas were drained two years ago and are now being

cultivated by the neighbouring peasants to whom the land has been granted.

(d) The remaining area of 341,000 stremmas has not yet been reclaimed. The greater part of it is intended to be used for the settlement of new communities.

The works on the 600,000 stremmas of land needing flood protection in the Salonika and Seres districts have already been completed and these lands are now cultivated by the peasants of the villages to which they originally belonged.

INCREASE IN THE NATIONAL INCOME

It now remains to consider how far the national income will benefit from the execution of the schemes after the application of the decisions described above.

In estimating the probable increase in the national income, the factors to be taken into account are the type of agriculture prevailing in Macedonia, the technical training of the Macedonian peasants, both natives and refugee settlers, the results of the State's cultivation of part of the reclaimed lands during the past two years, and the average prices of agricultural products without the protective duties at present in force.

Bearing in mind these factors, we may take as the basis of our estimate that the average gross yield of the lands protected by the new schemes in the regions of Salonika and Seres was 350 drachmas per stremma before the execution of the works, and 465 drachmas afterwards, or an increase of 33 per cent., that the gross yield of the reclaimed non-irrigated land will be 600 drachmas per stremma, and that the irrigation system will increase it from 465 to 700 drachmas for the protected lands, and from 600 to 900 drachmas for the newly reclaimed land.

On the basis of the foregoing data, the gross yield resulting from the schemes will be as follows :

A. Area covered by the schemes in the Salonika Valley :	Drachmas
(1) Protected lands :	
Increase in yield due to protective works : 300,000 stremmas \times 115 drachmas (465—350)	34,500,000
Increase in yield due to irrigation : 300,000 \times 235 (700—465)	70,500,000
(2) New lands :	
Non-irrigated : 219,000 \times 600	131,400,000
Irrigated : 100,000 \times 900	90,000,000
Total	<hr/> 326,400,000

B. Area covered by the schemes in the Seres and Drama valleys :**(1) Protected lands :**

Increase in yield due to protective works :	
300,000 \times 115	34,500,000
Increase in yield due to irrigation : 300,000 \times 235	70,500,000

(2) New lands :

Non-irrigated : 50,000 \times 600	30,000,000
Irrigated : 344,000 \times 900	309,600,000

Total	444,600,000
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According to these figures, therefore, the total increase in the gross yield from areas A and B will amount to 771,000,000 drachmas.

The following points should, however, be noted. (a) The distribution of the irrigation works over the different zones (protected and reclaimed lands) has been calculated roughly on the basis of the draft plans, which may possibly differ from the scheme finally adopted. (b) The gross yield from the irrigated lands has been estimated as considerably lower than could be expected from land of equal fertility in the hands of peasants with adequate training and sufficient experience of irrigation work. Unfortunately most of the peasants who will have to use the water carried to their lands by the irrigation system have not sufficient experience, either of the technique of irrigation or of the most suitable systems of rotation of crops and the cultivation of industrial crops, to enable them to obtain the best yield from the irrigated lands. The estimates are therefore based on the hypothesis of inadequate and defective use being made of the available water. The fact that it is to be utilised over such a wide area is also likely to create considerable difficulties, especially in the early years, owing to the lack of suitable organisation among the peasants, since it is well known that the satisfactory working and maintenance of an irrigation system call for effective organisation among its users, and this is usually the fruit of a long tradition which the Macedonian peasant does not yet possess. (c) In general, and for all the land concerned, whether irrigated or not, the gross yield has been estimated at a lower figure than what the fertile reclaimed land could produce if scientifically cultivated, particularly in the form of small-holdings. This is because a large proportion of the peasants who are to cultivate the new lands will be drawn from non-agricultural classes (cigarette workers), so that many of them will either have no bent for farming, or will fall short of the

comparatively high standard of knowledge and skill necessary to exploit the new lands to the full.

A further ground for making a conservative estimate of the probable gross yield of the land is that, for reasons similar to those applying to the irrigation system, the drainage system, too, is unlikely to work well enough, at least during the initial years, for the full yield to be obtained from the land.

The figures for the gross yield given above are based on an estimate of average prices for the 40-year period prescribed for the redemption of the loan.

During the first few years the average profits from the land as a whole will be appreciably lower because the soil will only gradually be put under cultivation, some regions not being expected to begin producing until four years from now. The productivity of the soil, and therefore the gross yield, will of course increase progressively as the lands are improved, this increase depending to a considerable extent on the measures taken to promote it by the State.

The effective exploitation of the new lands and of the newly irrigated areas, and the consequent increase in the gross yield, will also depend very largely on the technical training of the peasants, and especially of the newly established settlers from the towns.

Apart from the systematic cultivation of the ordinary crops, such as maize and other cereals, it will also be necessary to grow fodder and industrial crops (cotton, hemp, flax, beet, etc.) and to plant clover fields, orchards, and even vines where the ground is suitable. At the same time attempts must be made to encourage the other branch of agriculture, i.e. stock breeding. In estimating the gross annual yield, no allowance was made for possible profits from stock raising, which if developed up to the full limits of theoretical possibility could substantially increase the yield of the land. The estimates were based on the assumption that the average peasant normally keeps one, or at the most two, animals for ploughing, usually in bad condition and worn out by privation, and most of them in urgent need of replacement. Moreover, the stock bred by a small section only of the peasant population for meat or milk (cattle, sheep, pigs) belongs to unproductive breeds; thus adequate economic use cannot be made of the crops grown for fodder, which are nevertheless a necessary item in the systematic exploitation of the land, and particularly of irrigated land. Hence it is essential that the State

should devote close attention to the vital subject of technical training for the peasants by extending facilities for agricultural instruction. This, of course, is a task which will extend over many years and require patient and systematic effort. For that very reason, however, it cannot be postponed, but must be considered an integral part of the whole enterprise.

To judge by the data at present available, which relate to almost the whole of the reclaimed areas, it may confidently be affirmed that the exceptional fertility of these lands promises, if properly handled, to allow of the development of a systematic agriculture, producing a yield hitherto unrivalled in any other part of Greece.

ANNUAL CHARGES TO MEET CAPITAL COST OF SCHEMES

The capital already sunk in the works and the further sums required for their completion are to be paid off in 40 annual instalments to cover interest and amortisation, reckoning interest at 6 per cent.¹

According to the data set forth above, the total expenditure required until the completion of the main schemes, including the secondary drainage system, amounts to \$33,580,000.

Up to the end of 1931 the amount spent out of the two productive loans was £3,833,538, or \$18,631,000 at \$4.68 to the £. Hence there still remains to be spent on the schemes a sum of \$14,949,000, which has to be provided out of the national budget.

Taking the present value of the £ as 550 drachmas, the £3,833,538 owing to foreign creditors means a sum of 2,108,500,000 drachmas. This must be increased by 432,000,000 drachmas representing the difference between the issue price of the loan, which may be taken at an average of 83, and its par value, thus raising the total to 2,540,500,000 drachmas.

If it is assumed for the purpose of these estimates that the schemes described will be terminated by the end of 1935, that the new lands will begin to produce as from 1 January 1936, and that this capital was made available for the schemes as from 1 January 1930 and therefore must be increased by the addition of compound interest at 6 per cent. for 6 years, or 1,062,500,000 drachmas, the final charge on the works on account of the foreign capital invested in them may be estimated

¹ This is equivalent to an annual charge of about 6.65 per cent. on the sums invested.

at 3,603,000,000 drachmas (2,540,000 + 1,062,500,000), and the annual sum required for amortisation with interest at 6 per cent. for 40 years will be 239,500,000 drachmas.

Before the schemes are completed an additional \$14,949,000, or 1,615,000,000 drachmas at 108 drachmas to the \$, will also have to be provided out of the national budget. The first instalment of this amount was allocated in the budget for 1932 and the whole sum must be made available by the end of 1935; meanwhile interest will have accrued at 6 per cent. for an average period of two years, or, say, 200,000,000 drachmas. The interest and amortisation charges on these sums at 6 per cent. over a period of 40 years come to 120,500,000 drachmas.

The additional capital expenditure required for the improvement of the new lands was estimated above at 482,000,000 drachmas. To this must be added interest at 6 per cent. for one year, since it will be advanced in 1935, or 29,000,000 drachmas, thus making a total of 511,000,000, the annual charges on which, calculated as above, will amount to 34,000,000 drachmas. Lastly, a further sum must also be allowed to cover the annual cost of maintaining the works after their completion; this may be taken as roughly 3 per cent. of the total capital expenditure of 3,723,500,000 drachmas, or 111,000,000 drachmas yearly.

According to these calculations, therefore, the sum required annually to pay off the total capital cost of the schemes, including the annual cost of their maintenance, will be 505,000,000 drachmas for a period of 40 years.

PUBLIC REVENUE FROM THE WORKS

Under Act No. 5783 mentioned above, no provision is made for a direct charge on production so far as the lands now enjoying protection from flood are concerned, since, as already stated, these are held and cultivated by the local peasants and refugee settlers who received them years ago as part of their rightful holdings. The State adopted this policy because it considered that as it had itself provided for the settlement of practically all the peasant population by its measures for the expropriation of large landowners and for the establishment of refugees, it had no right to give less favourable treatment to the peasants settled around the protected areas than to those settled in more favourable regions not subject to inundation. For similar reasons no charge is to be placed on the 232,000 stremmas of

drained marshland in the Seres Valley, since this land has been ceded to various local peasants to complete their holdings.

As regards the newly reclaimed land, the Act, as already mentioned, provides for an annual payment in kind to the Treasury of 20 per cent. of spring crops and 25 per cent. of autumn crops, which goes to pay for the land. If the State's share in the gross annual yield as estimated above is taken as 23 per cent. on the average, the annual Treasury receipts from the new land may be estimated at 106,000,000 drachmas. If measures are subsequently taken to extend this tax to the additional yield resulting from the irrigation of the flood-protected lands, these receipts will be increased by 32,000,000 drachmas, making a total of 138,000,000 drachmas.

The present writer is bound to admit that he considers the exaction of these payments to be an uneconomic measure. If it is remembered that the whole of the property owned by the peasants—whether forming part of the expropriated estates granted them by the State or land formerly belonging to the exchanged Turks and granted by the Settlement Commission—is already burdened with a debt representing its full value, to be paid off within 20 years, and that the peasants' present holdings of 30 stremmas each are barely sufficient to provide them with a livelihood on the extreme edge of subsistence, it is impossible to justify the fresh burden placed upon the peasant in exchange for the grant of an additional parcel of land which does not represent a margin over and above the needs of himself and his household, but is necessary to make up a minimum family holding. This view can only be further strengthened by the consideration that the economic prosperity of the peasant is a primary condition for the raising of the present very moderate standard of technical training among the agricultural population of Macedonia.

During the early years in particular, when it will be a matter of vital necessity that the peasants should be able to acquire the extra implements and supplies needed to work their new land, it is most inadvisable that any possible surplus they might have available for this purpose should be swallowed up in taxation by the State.

Even the increase in the gross yield already discussed, which must be striven for by every possible means, will be retarded if the State maintains this heavy tax on production.

In view of these considerations, the present writer holds that

the price charged to the peasants for the new lands should not exceed that fixed by the Refugee Settlement Commission (now dissolved), and paid by the refugee peasants settled by that body.

If the price of the land were reduced, the sums received by the State would of course be very substantially reduced also. But as the amount required for the annual service of the invested capital amounts, as shown above, to 505,000,000 drachmas, while the direct Treasury receipts are only 138,000,000 drachmas, it is evident that in any case the latter sum is only a small proportion of the former. This is in harmony with the fact emphasised at the beginning of the present article, namely, that the schemes under discussion were designed primarily to remedy social evils, their objects being notably to improve public health conditions in the rural districts, to maintain the peasant population on the land by enlarging their holdings, to raise their standard of living by providing more adequately for their primary needs in respect of food and education, to relieve as far as possible the pressure of population in the overcrowded towns, and lastly, to promote the commercial and industrial development of the country while at the same time increasing the national income.