

SESSION 3

**Organization of the Club
and proposals for future activity**

G. Pellizzi

This third work session will be dedicated to the discussion and definition of the organization of the Club and its meetings, together with a consideration of the activities to be developed in the near future.

In this regard, I would first like to give you some details on the proposal discussed yesterday morning by the Management Committee.

First of all, there is foreseen an enlargement and modification of the Management Committee. This proposal, accepted also by UNACOMA, suggests including in the Management Committee a representative for African countries in the person of Mr. Ela Evina of Cameroon, President of ACEMA, the Euro-African Association of Centres for Agricultural Mechanization, with headquarters in Yaoundè, Cameroon.

Secondly, we propose to substitute on the Management Committee, Dr. L. Leviticus, who, on his own request, has informed us by letter that he can no longer follow through, on a regular basis, his work for the Club due to other professional commitments. Accepting his request with much regret and thanking Dr. Leviticus for his past collaboration, the M.C. proposes the nomination as member of the M.C., representing the USA, Prof. R. Hegg of Clemson University, North Carolina.

I thank you for your approval and consent.

Thirdly, we believe it in our interests to try to enlarge the number of full members with particular reference to countries, particularly developing countries, which we-re not taken into consideration previously. We are thinking in terms of Zimbabwe, Nigeria and Morocco, and we are awaiting news from them concerning eventual proposals of names and also, in any case, proposals of organizations of other countries and international organizations.

The fourth point concerns the need and

usefulness, confirmed also by UNACOMA, as the host organization, to organize meetings of the Club on an annual basis here in Bologna during EIMA. The purpose being to attempt to develop re-search and analysis activities for future worldwide requirements for agricultural mechanization. This, in our opinion, should have as its basis, a knowledge of the actual situations in a number of countries in order to then move forward and make analyses of alternative scenarios for future development of mechanization which also would take into account highly innovative technologies which were mentioned yesterday by Prof. Matthews and Mr. Lucas.

In this framework, it should be kept in mind that the work to be done is essentially aimed at furnishing, most importantly, to the operational sector (industrial and agricultural) and the political sector, a series of evaluations which can be applied in reaching more appropriate decisions relating to the worldwide evolution of agriculture and the inter-relationships with economics and markets.

Thus, it seems logical to divide our related activities into two parts: a first part should be condensed — and we will later request this officially by letter to Club members — in a report which relates to each country and in which each full member develops an analysis of the existing situation — something along the lines of the analyses presented by Prof. Kitani, Prof. Matthews, Mr. Lucas and myself and also by Marcenko for Russia and Ka Hua for China. The final objective is to formulate a "reference bank" which can then be used in an eventual comparative analysis.

I am well aware that this constitutes a substantial effort which is in part statistical; nonetheless, I believe it is most important that we work towards developing something of this nature. Consequently, we will send to the members a very simplified analysis scheme, asking them to follow it in preparing a 6-8 page report so

that we will be able to publish the complete body of reports.

This will help us in permitting the technical secretariat of the Club to formulate initial comparative evaluations prior to the meeting next year in Bologna.

The second area of activity which we would like to propose to you is that of attempting to develop methodology and conceptual types of analyses on innovations or on specific themes, making available keynote papers of high quality which can be distributed beforehand so that they can be discussed at our next meeting.

During the meeting of the M.C. we drew up a presentation of several of these themes which we would like to request that each of you take into consideration, so that we can discuss them all and choose, for example, two of them to be examined in 1990. Two other themes could then be developed in 1991 and so on.

The first theme concerns the *mechanization of small farms*, both in developing and industrialized countries. The problems in the two cases are, in fact, extremely different, even if in both, the topic should be considered in terms of the need to define "appropriate technologies".

In Developing Countries it will be a case of essentially defining technologies which are "labour intensive" even if the intensity levels are disparate, for use at different levels of economic development. In the industrialized Countries, instead, there is probably the need for the availability of highly automatized machinery which can provide low cost service in small farms, taking into account the part-time factor as well as the need to protect the environment.

In several European countries, in fact, there is already discussion in favour of limitations on the areas of farms, principally for reasons of environmental protection.

A second proposal concerns the implications of *agricultural mechanization in countries in a transitional phase*.

This theme, which has not often been

studied, seems to me to be particularly important in order to define the steps which should be followed. There exist enormous needs to be covered: one particularly relates to the fact that evolution of mechanization cannot be considered in a developing country if, at the same time, a development of the general economy, of the manufacturing industry of agricultural machinery and allied facilities are not also taken account of.

In order to produce machinery it is also necessary to verify if such production is worthwhile in terms of technical and economic factors and on this basis define the minimum quantity which is reasonable. This creates problems of: joint ventures among industrialized countries and developing countries; definition of the added value in the manufacturing sector of developing countries; analyses of progressive evolution. This is a multifaceted theme which deserves careful consideration and thought.

A third proposal concerns the analysis of the needs of *computerized management* in commercial farming.

What can be done, what must be done in this case? What is today and what will be the role of data processing mentioned by Lucas yesterday? As Matthews mentioned last night, what will be the role of high-tech engineering and physics on the development of agriculture and how can it be most efficiently and rationally managed? How, in other words, can high-tech engineering and physics help to preserve the environment, aid development in agriculture, protect mankind and improve the quality of products? All these points reflect back to what Matthews mentioned yesterday: from the application of sensor to visual systems, from robotics to artificial intelligence and model systems and so on.

Lastly, there is a final proposal — my own — which for me is extremely important, even if, just yesterday, it was briefly discussed by some members of the M.C. This proposal derives from the consi-

deration that, especially in industrialized countries, agriculture must respond more and more rapidly to changes in market needs and requirements, whose needs, in themselves, are changing with ever increasing speed.

If this is true, it means that agriculture must be ever more elastic and must be able to change its own productive targets just as quickly.

Given this situation, it goes without saying that present day mechanization, based on the construction of machinery which has an exceptionally long lifespan, constitutes a significant economic barrier for the evolution of agriculture and technological updating, as this same mechanization represents a non-flexible element for agriculture itself.

Please allow me to make an example; a construction firm producing tractors or agricultural machinery is, based in part, today, on providing a service for spare parts which foresees the possibility of furnishing these parts to customers for at least 15 years from the moment the machinery leaves the production line.

This reality is a factor which goes against technological innovation, which supports the secondhand market, which prevents innovation in agriculture and which certainly leads to added costs because, in order to maintain a warehouse stock of such entity for so many machines, for so many machines for so many years, increases marketing costs as well as those of the commercial farm.

So, my question is, can we not study some solutions which have a shorter lifespan and are more compatible (probably from 30-35% inferior to the present number) and of lower cost so that: a fleet of machinery will be easier and cheaper to re-new; farmers will be able to keep up with technological advances; the individual fleet of machinery can be reduced as well as stocks of spare parts and post-sales servicing.

This is an idea which deserves research and study and which could be, perhaps,

a study topic for a work team in our Club.

It is on the basis of these very general proposals that we want your opinion, in particular, to be able to organize and define our future programme for work and study.

Dr. Yoav Sarig - Israel

I think that before we get started one should review the purpose of establishing the Club of Bologna and, thinking of my-self as one of the initiators of this idea, which arises from the idea of the Club of Rome, I was surprised to find out that many of the participants do not even know what the Club of Rome is or was. I think, before we get started with the Club of Bologna one should get back to the sources. And, I think the idea of the Club of Bologna, which, in my opinion is a sound idea, a good one, provided we pursue it correctly, is that somehow with the group of, those considered senior scientists from all over the world, we should be able to make some planning for accomplishments in the future. I do not think we need another form of conference, there are enough opportunities for professional meetings and we do not want to have papers presented. I do not think that this is the purpose of our gathering together as a distinguished group. The idea is to benefit from the intelligence and experience of the people who are here or of those who are absent and full members of the Club and to be able to come up eventually with a series of guidelines for the future, with predictions; such as, where are we aiming in terms of tractors and harvesting machinery? And, hopefully, the policy makers worldwide, in a broad sense, would recognize the importance of these findings of this group. We are not talking right now about the mechanisms of how to do that and Professor Pellizzi has outlined some proposals on how to approach them, but, before we get started, we should be able, at least, to identify exactly what is the pur-

pose of this Club. I understood, for instance, from Professor Matthews, that there is already a group within the EEC that is doing work on high tech as related to agriculture. We do not want to have a duplicate of the work that has already been done there, we do not want to copy and I think we should focus on or find our own needs. Nobody is doing any work. That is basically at least, how I perceive UNACOMA, was motivated and I think we should all be grateful for this support of the idea, because they realized what we all lack, at the present time; something that the Club of Rome tried to deliver and was good at in its time and the work that has been done was very important at that time, and, in fact, was used by policy makers to make some global predictions.

That is the premise and I propose to you that maybe we should get started with a discussion on the purpose of the Club; what are we aiming at? What do we actually want to see in this Club? And then we could discuss some of the proposals that have been made by the management committee and maybe some other proposals that can be made by full members. And what I would like to see personally, before we depart all to his own country, is to see some specific goal set up and some targets for next year.

G. Pellizzi

Thank you Dr. Sarig. I would briefly like to answer you on two points.

First of all, the possible duplication with the European Committee Club of Advanced Engineering for Agriculture. In this case, I do not believe that the subject themes are the same. In the case of Europe, in fact, that is a union of research institutes which operates independently in their search to develop research themes for proposal, essentially to the directional bodies of the Community. Our purpose, instead, is that of being an observational entity or a think tank which attempts to understand

the present overall situation in order to make predictions for the future.

Secondly, your mention of the Club of Rome is most opportune because the Club of Rome, when that famous book was published which then resulted not entirely coherent with the reality of development, but which, just the same stimulated great interest, worked for several years in an attempt to develop analyses about the knowledge of the present situation in order to define predictions based on alternative solutions. Something along the same lines, if you remember, was carried out by FAO several years ago when it published a report "Agriculture in View of 2000", which proposed several alternative solutions for development of the various types of agriculture in diverse countries, with specific reference, of course, to developing countries.

So, I believe that our goal is similar and that we should be involved in discussions on future aims and accomplishments. But before we begin, we need to have a deep and complete overall knowledge of the existing situations in different countries.

We all, to a certain degree, are familiar with the realities in many countries, but we do not know the entire picture, and what we need is a series of basic facts and figures in order to proceed. This is essentially the intention of the proposal to divide the targets of the Club of Bologna in two areas: one concerning the knowledge of the present situation and the other concerning the study of several innovative proposals based on a thorough analysis for development.

Dr. Ing. Arno Gego - FRG.

I have a few comments and answers to your questions.

I was here this morning and last night thinking a little bit on the activities of the Club of Rome. First of all I think your activity is very good, should be supported and we should find a way to focus it.

I think the strategies for the development of agricultural mechanization is a good title; we should try to follow it. My proposition is not entirely clear at this moment and the question is how can we, with all these famous people from all over the world, move on to immediate results and publish it, not with many papers but by press conferences, by messages. The question is: could we find a system to get a message out next year, for instance, to have one focus message which is giving direction to one future question. You have mentioned a few questions and I think my proposition would be to concentrate each year on one point, to look for one global, very important message.

I would propose concentrating on regional more than country questions. I think, one can divide Europe into a few regions but not into so many countries. You see, maybe the message should concern the long term development of regions. The question could be: what is a region? But we can discuss it. Concerning the general programme of the meeting I would propose to look more for having round-table discussions and not formal things. Rather for round-tables to have a very open, relaxed discussion, not a lot of detailed re-ports but to think about how to arrive at useful solutions. I think for the next time we should organize a press-conference, maybe in connection with UNACOMA because UNACOMA should have the credit is due.

We should have a press conference immediately or after the meeting, working out the message in a small team and have the press conference at a later date because the timing is very important to have people. It could be an exhibition or I do not know what but you should have people together and a good representation of this group. You have been mentioning some items and I would perhaps give a few more ideas. For instance, questions like regional things, agriculture, environment in a special area case, the growth of robotics etc.

Prof. G.T. Ward - New Zealand

I have appreciated very much Doctor Sarig's remarks now and I just want to put forward the point that we should have some moral appreciation of the situation that I have come from the other part of the world which looks at Europe. You cut through everything, you know everything, you have done all the research, the fact that so many scientists have been made redundant in different countries in the last few years is a measure of the response of the population to the fact we already know so much but we have not applied it nearly enough. Now, we live in one world, what is the use of Europe having a very high standard of living when other people are so discontented, so dissatisfied, because they are under-privileged and they resort to violence and other things. We have to live together, all the populations of the world. The only way to survive is to cooperate with each other and so I think I would like to see more of the membership based on a population basis than on a rich men's club, if you like. I would like to see a strong representation of the undeveloped countries. Their best future is to form a brotherhood, as we have just been hearing, with the countries that need development, that need industrialization.

Then we should apply ourselves. We have already solved most of our problems really, the extra gains will be marginal ones. Now, our technology is so enormous that it is starting to destroy our own bed. Our own environment in the last few years has deteriorated so much! If we could focus more on a global view and on cooperating with areas that need industrialization we would profit or you would profit, in the developed countries, through more opportunities of applying all the knowledge that you have to these new problems. I mean, as far as I can see, in the last couple of decades there has just been a gesture towards the design of equipment, especially for different types of societies.

I think there should be a real commitment, not just in a benevolent sense, but because we will gain also from this new challenge in developing, helping to develop new industries. So, I just say very briefly, I would like to see a stronger representation on a population basis so that we can learn really what these new problems are in order to design equipment for resolving them.

A. Gego

We should give our contribution to arrive at a better view of agriculture. We have been talking about finding new titles I think if you are living in New Zealand you might underestimate the difficulty of the image of European agriculture. And it is very important that we are contributing to the better image of agriculture also, especially in Europe and in a very difficult situation.

Prof. Dr. Ing. H. Góhlich FRG.

I would like to come back to the contribution of my colleague Gego. I think he pointed out that the policy should go more on the line of the round-table discussion and I would point this out strongly, because in our experience, round-table discussions could produce quite good results. And, I would suggest that we should not limit our expert group only to these experts or to the members of the Club.

When we are discussing particular topics, and I think this must be done, we cannot go into general trends but we should try to find results that could be published, which could be transferred to the public. I think we need strong results and results on different topics. Matthews told us a lot of things yesterday. This can be discussed in such a way that might furnish some trends also for the political side. I think the connection we should try to im-

prove is also the link to political aspects. We should give the political people trends or recommendations from this expert group. And, I think this should be also in the line of publications and the better transfer of the knowledge. In my opinion this is very important, and in this way I would suggest it could be a means of extending this group to include other experts. If we are discussing particular problems it might be advisable to invite other experts for particular topics, perhaps only for this one session and then have our groups. This might also be an important way to improve this work of establishing, the best possible arrangements. So, I think the idea and the arrangement is very, very good and should be supported from all sides and everyone. But the results are also just as important so that we can find good ways and successful ways to come up with these results pretty soon, in the way I mention.

Mr. Yoshisuke Kishida - Japan

Several gentlemen have already talked about limitation of subjects. I'd like to propose one. At present, many countries like European countries, Asian countries and countries like Japan have a lot of problems about the concept of free trade of agricultural products, and especially some countries are insisting strongly, but this always means that a strong country has a good advantage. At present, this is creating the biggest problems for agricultural engineers, and also for the farmers in each country. Many people discuss fair competition in agriculture but we do not know what fair competition is. So I'd like to propose that the Club of Bologna should study: what is a true definition of fair competition. That means that in order to have fair competition we have to know the handicaps among the countries and that means we have to find what is a handicap for each specific country. Perhaps the Club of Bologna can take the initiative to

do the research, to know what is a fair handicap among each country for the agricultural production. I have been doing publishing work for almost twenty years to develop agricultural mechanization in developing countries but I am very sorry to say that the results have been very, very poor. I have observed in the past twenty years as gaps among countries have increased and this tendency is accelerating. That means: many developing countries are small-sized but compete in the Chicago market which is 2.000/3.000 hectares over the top. And, at present, many developing countries are marked by the lower price of agricultural products and this price is always decided in the international market, like the Chicago market. Therefore, who decides this price is a top farmer in USA, in Canada or in some other country. But this top farmer is an exceptional farmer. I can say the average size of those farmers is about $2/3$ hectares. How can these farmers compete with the top farmers? I propose to first make a study and then make a message about this programme. This is my suggestion.

Dr. Edmund Hetz - Chile

As I am the only representative from Latin America I would like to mention here several things which probably many of you already know. In Latin America there co-exist two very clear realities in relation to mechanization: a rudimentary form of agriculture and also a commercial agriculture which produces export products for developed countries and which employs very high level technology. This is true particularly in Chile for the production of fruit and vegetables, where the technology is on a level with that in California, just to cite the average producer. However, together with this situation, there is, at the same time, a very rudimentary form of farming carried out by the individual small farmer.

The situation of this small farmer was

well documented in a meeting held in Veracruz with the assistance of the British Council in 1987.

A club such as ours must maintain in its outlook and philosophy a sense of responsibility in respect to the large masses of small farmers whose forms of mechanization are very elementary and whose work is, for the most part, based on human labour and animal traction.

Mr. Bernard Cheze - France

I would like to express to you how much I appreciate the fact that the Club of Bologna is concerned with developing countries and I can only encourage this effort and in particular I support your proposition of having the President of ACEMA, Mr. Ela Evina be a member of the Club and also a part of the Management Committee. I would also like to mention that ACEMA is a Euro-African association and that it includes all European nations and also, English — speaking and French — speaking countries, not exclusively those that are French — speaking.

At the same time, I would like to suggest that the Club, since it is addressing the problems of developing countries, transfer, on occasion, or visit these same countries. I would like to remind you, for example, of the fair in Abidjan last 22-29 January. If I am not mistaken, UNACOMA participated in organizing this fair and so I would like to suggest, perhaps, that the Club of Bologna have a regional meeting on African problems in occasion of the fair in Abidjan. There will be an enormous turnout of African participants and it would be an opportunity to make the Club known. Also, the ASIE group could meet for the AIT week in Bangkok scheduled for the end of 1990.

I firmly believe that the Club should promote itself and in this consideration must participate and make contributions in international conferences of this type.

Mr. W.T. Brown - Australia

I am encouraged to discover that my colleagues of New Zealand think that Europe has already discovered everything, but I believe what remains an important task for the Club of Bologna and what attracted participants was the opportunity to discuss policy. There are an infinite number of conferences around the world at which we can discuss particular, technical issues. I do not believe that we need another conference. If the Club of Bologna attracts people like me to spend two million lira to attend a meeting then I think it has to have something special and it is preferably on issues of policy. It is policy in agricultural mechanization and there are plenty of issues facing us including a change in the nature, as it has been mentioned, of the market, of the tastes of consumers, of the nature of products. We are trying to address environmental and legislative constraints that are being put on an industry. They are the sort of policy issues and implications of this policy which, I think the Club of Bologna could profitably be discussing. I would urge, with due respect to Mr. President, we not have another day like yesterday when we had more than four hours without any discussion. Then, I think it is possible for some improvement on that. But, I support the concept and I think it is an excellent idea that there is an opportunity to discuss policies.

Dr. B.D. Witney - UK

I would just like again to support Bill Brown and Doctor Sarig in their views. I think the most important thing is agriculture and environment and this has major implications for the manufacturers and for all of us. And how are we going to go on improving our environment? How are we going to allow pollution to continue? We have got an image of agriculture where there are fewer people involved now as a

result that people are more concerned about pollution than they are about crop production. We have got to assure that there is a correct balance between these two and give directions to the manufacturers. So, I would like to see us looking at that problem, looking at the question of whether we can combine agricultural production with the popular image of the population of an idyllic countryside. I am sure we can solve the problem, but there are plenty of things available for us to look at in that area.

Dr. Ela Evina - Cameroon

In effect, a colleague has just spoken about strategies, and I wish to state my belief that these are most important for all developing countries, and in particular for African countries because, as you know, the technological levels are very different. On the basis of this, there is a sociological and also a political approach which is fundamental to our level, since we are still at the stage of introducing mechanization in agriculture. In view of the fact that we must all work and plan for the future, it is therefore important that a strategy be established and applied.

In the framework of a worldwide club, such as the Club of Bologna, it appears to me fundamental that a study group be set up to examine a strategy for the development of agricultural mechanization which would also include developing countries. Even if I entirely support the theme which has been proposed for study by my colleague just now, I believe it is necessary to move abroad, outside Europe so that there can be on site study and research.

In fact, when we have discussions with our European colleagues on these problems, they frequently base their reasoning on clichés, on what they have read, or on what they have understood from rather general and summary reports. If, on the other hand, one can personally observe

the situation on site, one is much more informed and able to propose solutions for those problems which exist.

J. Lucas

I am quite satisfied with the points which have been raised by our discussion, because I agree wholly with the idea that this Club should be a meeting point for dialogue on strategic problems, on analyses, of causes, for difficult debates and on deciding our directions for priority work, both for those seeking advice and industrialists.

I think that themes such as "Agriculture and Environment" which Prof. Mat-thews proposed as President of the Club of Advanced Engineering, or "The Strategies of Mechanization in Small Farms in Developing and Industrialized Countries" are both absolutely essential topics to be examined.

These are certainly the only ones because the bulk of economic problems and macro-economic and micro-economic strategies created by mechanization an explanation and a presentation as regards public opinion. I believe that the fact that we represent a reunion of "high level brainpower" should perhaps also encourage us to prepare round table discussion which you have been suggesting just now and that we should carry this idea for-ward.

The presentation of documents, which will be more or less a condensation of the ideas of those who wish to express their opinion is also a most interesting proposal. The advance distribution of such documents will allow us to better prepare the round table discussion and meetings and to organize our conclusions prior to presenting them to the press and the political entities, so that they can be aware of the bases of our work.

This is necessary for good publicity and diffusion of the results we have achieved.

O. Marchenko

I will try to express my idea about the activity of the Club. It seems to me that there are objective reasons for any country which connect it to other countries. For example, Asia, Africa and Japan have very small farms, while in other countries they have big ones, and so on. We cannot influence this so we should take in-to account this situation first. But how should we influence the industry production? Because all industry representatives would like to have profits, just profits, this without taking into account the influence on environment, or pollution and other aspects. So it seems to me we have to work out influence to industry, first of all. We have good strategic proposals, we have good ideas on how to prevent environment from pollution. We can work it out, but how can we introduce it in life? It is a main aim of ours, how should we influence industry in order to make everything in order to prevent the environment from pollution. The big cost of technology may cause a rise in the cost of agricultural products. It is our proposal, but how should we do it? Should we work out special mechanisms and maybe some approval of it at the international level? That's all.

Y. Sarig

I think I can speak for the rest of you in this room in saying that nobody would like the idea of the Club of Bologna to be considered as a passing episode and we have to remember that we are a voluntary club and here we have a problem, because in order not to be remembered as a passing episode we want to make our voice heard. How do we do that? We do that only when we establish the fact that the findings of this club should be heard and policy makers take advantage of these findings. And, I fully support Gego in saying that what we need is exposure. But you develop exposure only after you have

delivered something. So, in that respect I think Mr. Lucas is right in saying we have to bring some findings, some studies, some designated studies and, based upon these well-documented studies we can start to deliver. And for the sake of being pro-vocative, in order to stimulate perhaps more discussion, the kind of issues that I think we need to address are those that are of the interest to the industry. We all have to remember that in this idea of the Club of Bologna, supported by UNACOMA, they took the initiative and they did it because they want to support, to help their manufacturers, to give their manufacturers some guidelines: what are we aiming at? What type of machinery are we going to see in the year 2000 and beyond? And, some people have evocated that they should reduce farms, maybe we do not need the 2000 hectares farms, even in the well developed countries and this is not a new idea. The problem is how to work it out. So, first we need to address what are the critical issues, otherwise we cannot tackle them on a broad front. So, we should tackle them one at a time. For in-stance, the environment is a major issue worldwide and the small farms are a major issue. I can be provocative in that respect in saying that many people have said that we do not need robotics. Those of you who have read about the agricultural engineer issue, and I am not passing judgment now, but they have read of robotics at a very low priority. Now, I am not saying who is right, that they are right or we are right. Some people argue that image processing is a good base word, but who is going to benefit from image processing? A lot of work has been done in image processing in research but could you show me five commercial machines that have been put into use emulating image processing? And believe me there are not even three and I know they are not very effective. So, these are the kinds of issues that we need to address. Should we put more effort into that area and hopefully the manufacturer will be able to sell more

machines based on this track. And again do not get me wrong, I am not giving you my ideas of what is right and what is wrong, but these are the issues that people would like to hear, some expert's voice.

Dr. Williamson - USA

Education? What about the next generation? What could the Club of Bologna do to help in attracting people into the profession. In the USA agriculture has a poor image, we have difficulty in retaining students, we have difficulty in attracting graduate students. The next generation, they will be sitting here at the Club of Bologna in 13 or 14 years. So, what can we do to get young people into mechanization. We have a problem, maybe it is not a problem in the other countries but it is a problem in USA. Could the Club of Bologna bring young and outstanding people to such a meeting as this and have a special programme for them. So, that will be an idea, how to develop a global strategy? Education; that is one point I wanted to make. Second point: what are so-me of the philosophies that are taking place in agriculture in different countries. I heard some today. I think this should be a purpose of the Club. In the USA one of the major issues is LISA: low, impact sustainable, agriculture. That is great money. What it means is that we are dealing with communities on a worldwide Chicago market basis. How can we produce those products with good quality at a lower price? So, what I would suggest is that in our situation, we have to have mechanization that has to be taken into account. Today we are using less horsepower, we are doing conservation tillage. The practices may not apply in your situation but they cannot say they are useless. We want to have lower energy requirements, simple to maintain and we do not have the resources to pay for technology. As long as we are competitive I do not see how we can afford high technology. I think it is

important we develop this but in the foreseeable future we have to look at some of these engineering thoughts in the country and I appreciate hearing it this morning but in our country the current one is laser, not robotics.

Prof. Ettore Gasparetto - Italy

I wish to go on with Mr. Sarig's arguments. This kind of strategy is very important. When I am working outside Europe, in South America, Asia or Africa, I am always amazed about the big differences in the tractor and agriculture machinery market and the existing fleet between the different countries.

Often I ask myself which are the reasons which determine such a behaviour. There are a lot of reasons, of course, the type of agriculture, the dimension of the farms etc. but overall the price of agricultural inputs and products.

I remember countries where the tractor sales fell in two years from 27.000 to practically nil (I am referring to Argentina); this was mainly due to agricultural and machinery prices. As a consequence, I think that one of the tasks of the Club of Bologna must be to study the relation among all these factors, in such a manner as to have the possibility to judge the fleet and the market of agricultural machinery and tractors and to establish some parameters to help the industry and the policy makers.

Thank you.

O. Marchenko

Mr. Sarig promoted some topics. I would like to ask him if he seriously thinks that we can influence the size of farms. For example, in our country, it maybe because we have many collective and state farms. But it seems to me that for many countries in Europe it is difficult because it is connected with the human, with the

person. Some people are very active, productive, they have good profits and production on their mind and can cultivate. It depends on the person and farms can-not be divided, subdivided it is difficult to regulate. So, I ask Mr. Sarig: is your idea serious or is it provocative? I think it would be nice to have a chance to influence, to regulate the size of farms and have a unification of this. It would be interesting but it is difficult to do.

J. Matthews

Just three thoughts.

The first one is that I very much subscribe to the idea that we must make use of our corporate brainpower. That was, I thought, one of the real potential values of the Club. On which subjects we do this is, I think, becoming clear. We are beginning to focus and that is pleasing, and I certainly support the question of environmental issues as highest priority. I would add other things which are not purely environmental but nevertheless socially motivated, such as the welfare of farm live-stock and agricultural image issues as being also important. I very much support, and indeed suggested, the mechanisation of small farms because I think it is an area which has not had the sort of brain power focused on it that is available to the Club. I have attended a number of discussions in that area and often many people who are not engineers who are agriculturalists, predominate. There are certain people in my Institute, for example, who work in this area. I think they would like the support of the brain power of the Club.

The other topic suggested, the potential for new technology, is equally important. It has been suggested that the way ahead for agriculture is to lower inputs and other suggestions have been to increase the level of technology. I hope these are not regarded as conflicting views and opportunities but rather as complementary

possibilities. It will be relevant to point out that within the European Community our vision is that we can decrease the production costs of cereals by as much as 25%. This would be achieved both by reducing the quantities of inputs such as fertilizer or protective chemicals, and of doing so by employing higher levels of technology.

Robotic milking has been justified by the fact that calculations suggest that its break-even point will be a 60-cow herd and that it will be cheaper than existing techniques for herds above that size. There are also already some signs that robotic techniques allowing the cow to milk itself may improve welfare through reducing diseases, fundamentally because the technique allows a reversion nearer to nature. In fact quite a lot of the higher levels of technology are enabling us to design and develop systems that slightly more nearly approach the very sophisticated systems of natural life.

Prof. Luis Marquez - Spain

I believe that our discussions this morning have shown a basic common idea. As Prof. Gego reminded us, our objective must be to search for strategies for the development of agricultural mechanization and along with this the development of agriculture itself.

My experience in field of agricultural mechanization in Europe and in the different countries of the American continent as well, have led me to consider that while the European farmer only knows how to cultivate, farmers in developing countries have not yet learned how to do this.

For this, the European farmer can efficiently organize a rational crop cultivation for markers while, for the farmer in developing countries, there is a larger quantity of uncultivated land than in European countries so that the important factor is extension and increase of capacity.

Besides this, there is a basic idea con

cerning mechanization for the future beyond what has been discussed in the past years: the necessity for machinery to be adapted to agriculture and not the contrary, as seems to be happening. World agriculture is tractorized but it is not mechanized. We think that mechanization can come about with animal traction, together with manual labour; the tractor is not to be left out of consideration and its use must remain compatible with the level of technology.

For this, the idea is that this Club can be useful for proposing strategies for agricultural mechanization so that political forces will be able to give the farmer what he needs and what is necessary; not solutions which are political but do not resolve the real problems of the farmer.

This is the most important aim we should be working towards.

Prof. Franco Sangiorgi - Italy

I am not a member of the Club, but as I have been following the discussions of yesterday and this morning, I would like to have the possibility of saying a few words.

The very interesting problem which has emerged from the discussion is the necessity to hold meetings for the exchange of ideas. One of the most opportune topics could be exactly that of evaluating the influence of low chemical impact agriculture on mechanization.

The fact that there are, as mentioned previously, for example in the USA, tendencies to put back into operation agricultural systems which more greatly make advantage of crop rotation, signifies a total changeover in the mechanization of farming industries. This means a complete change in the dimensions of the machinery and as a result, a completely different scenario.

Therefore, it would be interesting to develop a further study of an evaluation of what is happening in different countries, but all countries.

How can we face the problem of the transformation of the landscape and the terrain and of agriculture; how should agriculture based on a reduced use of chemical products be managed? These topics appear to me, at present, to be of primary importance.

Y. Kishida

Another point I would like to make is related to the smaller farmers' program-me, especially in the more developed countries. In the case of Japan we have about 4.3 million of farmers and 80% of them rely on the off-farming income. The average income is now much higher than the average income of city people. But in our farmers' amount of total income 80% is occupied by income from another job. And also, in the case of the USA, where there are 2.2 million farmers, the average income is higher than the average income of Japanese farmers. And also the amount of average income is more than the agri-cultural income in the USA. Maybe there are signs of this also in Europe and that creates some new thinking. We have to study more about new styles of farming. A farmer has multiple jobs and each job requires high productivity, but if the farmer can get a multiple job, in this case that gives the highest productivity. Because in any study of agriculture everything depends on the different seasons. In many countries like Europe, USA and Japan we have to study more about this problem. But there are some governments, for example. Japan, that do not want to continue with this kind of farmers. They want to encourage more professional farming, but we have to study more about the new possibilities that a farmer has to have another job. That gives a highest, productivity to use his total available time in one year, especially in the northern part, in the winter season sometimes farmers do not have any other job. 45% of total of his time is wasted, this is decreasing produc-

tivity. It means, as I say to please study this new type of farmer in developing countries which has multiple jobs and a new study of mechanization is also needed, this is my understanding.

G.T. Ward

I had the chance to go to China last September to attend a FAO panel meeting and I can say that the Chinese have developed the machinery industry on a huge scale. They have more than 2.000 factories and their production for tractors is now more than 600.000 units. Of course they have limits: 90% of total local production tractors and the 20 horsepower. But, among those modern tractors more than 60% is 4-wheel tractors. In one factory we visited they produced only one model for more than 1.000 units at a very cheap price. China has a big population that means they require a huge machinery industry but, anyway, they are coming along very quickly. In the last centuries China has had a great influence on the total view of mechanization.

Mr. J. Vowles - UK

I think one broad trend recently has been the transfer policy in a number of countries from the very large enterprises to a smaller scale. I was in China last year and to follow-up, in China, now. Many small family farmers are encouraged, in USSR we just heard that there is a tendency towards smaller scale farming. I think this is a broad trend. It has social and environmental consequence from the environmental point of view. Pressures on the environment from large-scale agriculture are very great and problems are great. A couple of years ago, I visited East Germany. There, for instance, they have large oak farms and this created very great pressures on the environment and big problems of pollution control. So, on one

hand there is a tendency to smaller size to reduce the pressures on the environment, and on the other hand, there is the social side that, as farmers become smaller, more managers are required. Then, I think there is a big challenge ahead of us as we heard yesterday in management and the importance of bringing computers into the smaller size farms. The farmer has to be very efficient, there has to be more education of farmers because with the smaller sized farms there will be many, many managers. In the USSR they lack experts for management, it is a lack that is felt and we have to cooperate on a project, in deciding exactly what management courses are required by these smaller farmers.

G.T. Ward

I think that the major issues which have been coming across very well in the morning are: environment, both external environment and environmental control for welfare are the major issues. But they are really the major issues in the developed countries where we have plenty of food. They are not acceptable issues for the population in the undeveloped countries where food is short. We have to take that fact into account. There is a great deal of difference also in small farms, basically in southern Europe, and small farms in the undeveloped world. But the key to this is to persuade the manufacturing industry that they should invest in this because they are all struggling worldwide to maintain their companies. There is a tremendous pressure on margins. Fairly substantially the only market in Europe which is going other than downwards is the Danish market and that is because Denmark was low last year and the year before. They have had a little success with the pigs. But tractor sales in the UK are down and also in France, Germany, Italy and Spain. Now they are down in USA but only by a fraction of %. Your job is to persuade the manufacturers that you can pro-

vide them with ideas, with technology that is going to allow them to continue in business. And I do not think it will be easy, they have to be looking for levels of production. They have to keep their factories, we have to accept the fact that the pressures on each of the companies are going to force more of them out of the business. We have seen this and major changes will be seen in Italy in the next years. A tremendous number of micro economies are gathering together. You can see it in tractors and industry where we have lost independent tractor companies and we are going to lose more independent companies in the next years.

O. Kitani

The Club of Bologna has stated some ideas similar to the Club of Rome. That means we put stress on rather general and more fundamental issues rather than very specific and short-sized ones. I think all of you here present are more or less involved in these fundamental things. We could do some surveys based on a very simple format. I think it is important to do our best, to correct what we can do and to compare the critical issues in each country.

Another item: we should forecast several important topics and pick them up one by one and discuss each of them and put in some good proposals, good suggestions for the future and try have some influence on our future mechanization in the world.

K.T. Renius

I think we have a lack of industrial representatives in our discussion. You mention that everyone was thinking about that. We need this discussion, otherwise I do not see a future for our work. Another proposal: I see here an environment problem, the climate problem as the num-

ber one. You should have a balance of oxygen and CO₂ and perhaps we can plan next year or later a meeting on that problem, putting together experts using the main Club of Bologna to work only on that problem. We have written about many problems politicians have their stand-point and perhaps it would be good to have a discussion between different people from different areas and to publish the results, only on one topic. I agree with Gego's proposal but to focus on some specific and interesting issues. It is very difficult to find subject themes for our work but I think without considering industry and concentrating on it, it will be much more difficult to succeed.

G.T. Ward

Considering the main item of agricultural environment I hope, Mr. Chairman, that the global environment is included he-re and not just the environment of high track countries because we are all going to be affected by the problem. We must remember that very great environmental pressures in the developing world which can have serious consequences, as a mat-ter of fact, exist already.

J. Lucas

Mr. President, I am worried just the sa-me for the fact that at our next meeting we will be discussing only one theme. In my opinion this risks becoming a bit limited and, even if we choose a central the-me we should be concerned with taking into consideration at least two, if not three others. The reason why I raised my hand just now was more that I do not agree with the establishment of one theme as I entirely agree with Mr. Sarig's proposal. That is, environment, small farms and new technologies.

Would it not be possible to have a main theme on the environment and to have,

for example, some secondary themes which can serve as preparation for meetings in the future, from the point of view of publicizing them to those outside the area of our Club, which will demonstrate to public opinion and governments that our approach is not simplistic and too concentrated in one area?

J. Matthews

Picking up the first point that Mr. Lucas made, I would suggest that the Management Committee meets before the main plenary session and prepares an outline proposal for subject number two for the next year. I hope this will deal with the mechanisation of small farms. At so-me part towards the end of the meeting, therefore, there could be a presentation of the Management Committee of the next year's programme and that could be approved to go ahead in that year. One therefore has a rolling arrangement dealing with the main problem only in depth with the whole group, but with the Management Group beginning its preparation for the principal topic for the next year.

Y. Sarig

I would like to mention once more the question of inviting specialists in this area of agriculture and environment because we might be able to discuss this point, de-finitely with all the different knowledge that we have about it around but I think there are a lot of people on the outside who are more or less involved in this point of discussion and I think it would be advisable to invite people here for the discussion, to have better results.

Y. Kishida

I agree with Matthews. Also maybe he-re we can decide not only for the 1990 sub-

ject, but also for 1991 and 1992. Of course, we can change but it could allow us to have more time to prepare the discussion. I had not enough time this year. If next year is environment, agriculture, maybe in 1991 another thing and in 1992 a different one. We can change, but at least three years is possible. Do you think so?

J. Lucas

No, it is for reasons strictly related to the presentation of our discussions to public opinion. I believe that this is a very important point. We must choose the most important themes. They could be of interest to all of public opinion if they are well presented. It is a certain fact that an essential problem is to reduce production costs. Be we must find the ways for presentation which make sense and are convincing and this is why I am concerned about a successive presentation of three themes which are programmed for three successive years.

I believe that it should be in our interest to present, during these first years a certain number of themes, such as work projects to keep for the future — three, four, five years — when we present a worldwide type of report such as that of the Club of Rome.

If we choose one theme each year, it will appear that we are making a definitive study on that theme, whereas if we take up several subjects each year then we will be able to offer and advance original ideas which will later be defined in a definitive report.

In parallel fashion, we will be able to have a reaction on how those ideas have been received by listeners and the general public and, above all, have, in a short time, a trademark.

This is the reason for which I, personally, remain most favourable for a programme which examines at least two themes, if not the three as suggested by Mr. Sarig. I am, in any case, favourable, that

these should be our themes for the next year.

A. Gego

I still think the last proposition of Matthews is good. We agree it is an attractive thing, a difficult one. We need the conference in order to come to a proposition, a message and we have to take the responsibility to give the message. It is at this stage something definite because we are trying to get all the experience we can get to give the message. We need two days to discuss, otherwise we are losing energy. We have to take the responsibility to talk a little more about small farms. Small farms is a thing which has been discussed for twenty years. I have been involved in it and may be you also. It is an important thing but it has to be well prepared, it takes a lot of time, at least one Bologna session, to really give new input and new re-commendations. So I would ask you to concentrate, to focus on one point to make it known. Otherwise we are wasting time. I prefer to talk a little bit on optimization of costs. To concentrate on one thing would be more effective and more attractive not to perpetuate our staying in a club dealing only with one issue and give some focus on items for the future. So that could be a sort of balance.

Y. Sarig

Naturally we are trying" to find which is the correct mechanism of approaching so many issues in an optimal manner. I have suggestions to make which can be a sort of compromise. I think that I would support the idea that one thing should be tackled at a time because I fully agree with Professor Renius (probably) that although without underestimating the experts we have in this room, we need some dedicated experts in some areas and if you want to invite two or three experts you

should have time in advance to contact these people and possibly ask them to submit something in writing before the meeting so that we can be prepared for discussion. So, if you take into consideration that you are going to have a presentation of the experts and then a presentation of the members of the Club and then a discussion, that will take up a good deal of the meeting. However, I think also Mr. Kishida has a good idea in saying that we should give a message about the programs of our Club.

Williamson

I feel that we have considered a lot of things but identified only one thing. My view is that when we consider that in de-tail we will identify a number of facets we have to consider by means of smaller working parties and then all of them will be part of the main report, rather than loo-king at them as separate issues one after the other. Just to give an example: what is the effect of reducing energies over the next 10 or 20 years? Will we still have tractors, or we will move to something different or we will go back to animal track?

Ela Evina

I believe the we should not forget that our Club must deliver a message of hope, and while we are meeting here many people are expecting to hear what we intend to tell the world. If, since the beginning of our reports, there are those who do not feel immediately concerned, it will only mean in the long run that we are limiting our audience. Even if the theme chosen is interesting, "Agriculture and Environment", it is not among the immediate daily problems and preoccupations the world over. So, then, in the scope of our decisions, if we address the study of problems which in-volve the entire world, I believe that our words will reach a greater public.

J. Matthews

I wonder if a number of members would come for this because perhaps they might think of it as an industrial problem. I hope it will not be seen that way. I hope that perhaps they will consider it broadly enough to realise that one of Africa's serious problems, in my view, is soil, and in particular what is happening to soil erosion. Every river is brown with soil flowing away. I think if we broaden it sufficiently there should be no regional limitation and no part of the world need feel not involved in the topic. We need that message to go out to those members of the Club who are not here and may well be thinking that we shall be talking only of industrialised areas.

J. Vowles

We are all together as human beings and when you put as the major thing the environment and the agriculture, the implication is that our way of life is involved. It is the influence on the human being that is important. I would suggest as a parallel thing the influence of mechanization on the standards of living also. It is implied that by protecting our environment we are maintaining our living standard on a global base. And as a parallel thing we have to focus on the problem of low material standards of living which is also a paramount in developing countries.

G. Pellizzi

Thank you for your contributions, now let us attempt to arrive at some conclusions.

First of all, I would like to remind you that this meeting was organized so that we could get to know each other; it is the first time that we have come together as a group. I am, in any case, entirely in agreement with the proposals which have been

made and I will personally do my best to see that UNACOMA works towards carrying them out, particularly and foremost, in organizing our next meetings on a true round-table basis, also as regards our physical distribution.

These arrangements mean, however, the need on the part of all of us, once the subject themes have been defined, to study as quickly and thoroughly as possible, these themes and prepare an individual report so that all members of the Club can receive the reports of others in advance. This will mean that in the following meeting, each member will have had the possibility of knowing and reviewing the opinions of the others and will contribute to a more precise development of an analysis.

In second place, I agree that at the end of each meeting there should be a press conference and that the Press should be furnished with a report of the conclusions and results reached and the lines of development on the specific themes. This will require the setting up and organization of a group of young people to participate and serve as technical secretariat for the Club.

Another important point was brought up by Renius on the need to involve the industrial world in our discussions and work. I believe, in fact, that we should make every effort to include in the Club qualified representatives of industries in the sector from various countries, as a primary contact point and go-between to make the decisions we have reached known.

It is also clear and confirmed that the aims and purpose of the Club are to contribute to a definition of strategies for the development of mechanization on a worldwide level, taking into account the needs of the agricultural structures, of the social and economic situations and the market problems and those of industry in the individual countries.

For this reason, I wish to insist, with your permission, on the necessity of an initial examination of the present political policies in force in each country regarding agriculture and mechanization.

Another aspect is that concerning the more important themes and it seems to me that three have emerged on a priority level.

The first is that related to the problem *agriculture and the environment*, from the point of view of what mechanization can contribute towards protecting agriculture and the environment, to render its role more acceptable to the population and to work to benefit mankind and the animal world. To this end, several experts should be chosen to prepare keynote papers.

The second theme, I believe, is related to the *mechanization of small farms*, both in developing countries and industrialized ones.

The third theme is that mentioned also by Matthews: *new high-tech mechanization which reduces inputs in agricultural production*.

It is clear both these themes are interconnected in some measure with the more overall problem of agriculture and the environment.

I further believe that three themes for discussion in 1990 are too many and that the best thing is to choose a principal theme and to level the others as secondary.

The final proposal is thus the following:

- *main theme:*

— new mechanization to protect agricultural environment;

- *secondary themes:*

— mechanization for small farms: i) in Developing Countries; ii) in Industrialized Countries;

— new mechanization to reduce production costs of strategic crops.

I think, at this point, that we should consider at least two days for full meetings, the first could be entirely dedicated to the problem of soil erosion, as mentioned by Matthews, which is very important for tropical countries, but not only there alone.

We could divide the second day into two half-day sessions to confront the two secondary themes.

There will then be a press conference or-

ganized for the end of the second day to announce the results of the discussions and the Management Committee will al-so be asked to hold a meeting on the afternoon proceeding the day of the actual meeting to define more clearly the agenda and programme. Having said this, I think we can adjourn. I thank you all again for your participation and important contributions during our discussion. I wish you a safe trip home and mention a word of thanks to the interpreters.

J. Matthews

May I just on behalf of the members of the Club and visitors to the meeting, thank you very much for your hard work. Can we thank your colleagues from Milan who have organised this so well. Could I also ask you to convey to UNACOMA our thanks from the members of the Club and visitors for their hospitality; it has been very nice.

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