SUBSIDIZED SMART FARMING AS A RISK FOR DEVELOPING COUNTRIES

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ABSTRACT:

The European Union is a pioneer in so called ”smart farming”. Due tothe opportunities of Industry 4.0 the EU’s agriculture became one ofthe most efficient in the world. The high amount of domestic support allows investments that are inaccessible for farmers in developing countries. This paper underlines the increasing North–South divide caused by the high investments in the EU in digital farming and a great lack of investment possibilities in developing countries. This leads to an inefficient agriculture, decreasing jobs in the agricultural sector and a dependency on production resources and agricultural products from the EU in West Africa. By citing farmers and experts from West Africa this paper presents the perspective of West African farmers and experts on the impact of digital farming.

Key words: ***North–South Divide, Digital Farming, West Africa, Agricultural Subsidies, Distortion***

1. INTRODUCTION AFRICA AND SMART FARMING

The industry 4.0 took over all sectors in industrialized countries and that is whycurrently,agriculture in most countries in the EU is transforming to “smart farming”, “digital farming”, “precision farming” and finally to “agriculture 4.0”. Digital farming means “the practice of modern technologies such as sensors, robotics, and data analysis for shifting from tedious operations to continuously automated processes” (Shamshiri et al. 2018: 1). The result is smart farming,and this implies the “intelligent use of data-rich information and communication technology services and applications.”(Wolfert et al. 2014: 2) By using the opportunities of modern technology farmers in the EU are reaching a high level of precision and enhance their productivity to a new stage. It is not the aim of this paper to reproduce the whole discourse about the massive impact of smart farming and digital farming. The aim is to evaluate the potential risks for a one-sided installation of smart farming in the global north and especially while the global south is excluded in this transformation. This paper will use the term

"smart farming"andthis includes in this case "digital farming", "precision farming" and "agriculture 4.0".

To understand the impact of using digital and smart farming in the EU on countries that are excluded of using these tools it is necessary to comprehend the enormous advantage that the EU is gaining. There are two main reasons why the EU is currently successful and will be even more successful in installing smart farming: First, in contrast to developing countries in the EU most farmers are middle- or large-scale farmers. Therefore, it is easier for the EU to install smart farming systems on its large-scale farms. Second, the EU has a large system of domestic support that amounts to 59.6 Billion Euro and this is with 36% the biggest expense item in the whole EU budget of 165,8 Billion Euro. (see European Commission 2019) Currently, the EU is restacking its payments for farmers from so called direct payments per hectare to the greening expenses. This process is called modulation and means: "A restructuring of the financing from the first to the second pillar followed to strengthen the structural policy by reducing the direct payments." (Härtel / Ren 2018: 20) Due tothe fact that scientists see smart farming as an instrumentto reach sustainability in agriculture (see Bach / Mauser 2018; Rose / Chilvers 2018) the EU is supporting networks and platforms about the integration of smart farming. The EU also hopes to improve efficiency and attract young farmers as digital entrepreneurs to build an existence as a farmer. At the same time, more efficiency means more production, and this leads to the necessity of more export. In quantitative research it was already found that the current export of agricultural products from the EU to Africa has a negative impact on local producers in Africa. They cannot compete with the lower prices of the imported products. A liberalization of the agricultural market can lead to a significant poverty reduction. (see Anderson 2016;Boysen/Grinsted/Matthews 2014)The hypothesis of this paper is that smart farming leads to a higher risk for an increased North–South divide. The reason is that the current agriculture in the EU is already so effective that it produces overproduction. Eventually, with subsidized smart farming the EU becomes even more competitive and the efficiency increases faster than ever before. African countries with a large small-scale production sector will experience a setback and will not have the possibility to catch up with the EU's efficiency. Potentially, this will tie the agricultural sector up and Africa becomes even more dependent on agricultural imports.

This paper offers a qualitative-based research to answer the question which impact smart farming in the EU could have on Africa in the view of local producers and on the North–South divide by analyzing answers of 69 farmers and experts in Ghana, Nigeria and Liberia.

2. RESEARCH DESIGN AND METHODS

This research paper uses a qualitative approach to analyze the views of local producers and explore new insights in this topic. The three West African countries Ghana, Nigeria and Liberia are in the focus of this paper to investigate the common economic zone ECOWAS (Economic Community of West African States). The EU tries to negotiate EPAs (European Partnership Agreements) with such regions. The three countries are representing different economic statuses: The World Bank classifies Ghana and Nigeria as Lower Middle Income Countries and Liberia as a Low Income Country (World Bank 2020). Therefore, this paper can investigate whether the opinions differ in different economic statuses. The analyzed data contains interviews with 69 persons in the three countries Ghana, Nigeria and Liberia. The interviewed persons are experts and/or poultry farmers, fish farmers and milk farmers. The experts are researchers, consultants, entrepreneurs, politicians, NGO representants, ministry employees and local governmental advisors. Theinterviews were conducted during three research stays and in cooperation with the Delegation of German Industry and Commerce (AHK) in Ghana, the localNGO ProtectOzone in Nigeria and the Food and Agriculture Organization (FAO) in Liberia.

	Poultry Farmers	**Experts**	**Fish Farmers**	**Milk Farmers**
Ghana, *N=16*	10	10	0	0
Nigeria, *N=42*	12	17	8	6
Liberia, *N=11*	9	7	0	0
Total, *N=69*	31	34	8	6

Figure1: Number of interviewed persons divided in groups

Symbol	**Country**	**Function**
B	Ghana	Poultry Farmer
E	Ghana	Expert
BFE	Ghana	Poultry Farmer and Expert
D	Nigeria	Expert

F	Nigeria	Poultry Farmer
G	Nigeria	Poultry Farmer and Fish Farmer
M	Nigeria	Milk Farmer
J	Nigeria	Fish Farmer
C	Liberia	Expert
H	Liberia	Poultry Farmer
HFE	Liberia	Poultry Farmer and Expert

Figure2: Legend for the interviewed persons

The data was collected in a PhD project that is not published so far and investigates the "Impact of the Agricultural and Trade Policies of the EU on countries in West Africa in a Neocolonial Context". The experts and farmers answered two different questionnaires in guided interviews.In a qualitative content analysis oriented by a scaled qualitative research approach by Mayring (2015) the PhD project worked out codes. The codes that are relevant for the investigation about the impact of smart farming in the EU on West Africa and on the North–South divide in the view of local producersare in figure3 were used for this paper. To answer the research question of this paper the analysis extracted new categories for the codes. The category groups are in figure 2.

Subsidized smart farming the EU generates:	
Category 1	- a higher risk for an increased North–South divide
Category 2	- no higher risk for an increased North–South divide

Figure2: Categories for the analyzed codes

The extracted codes have a connection to the question about the impact of smart farming in the EU on West Africa and on the North–South divide in the view of local producers. For this paper, the codes in the categories were grouped in subgroups.

Subsidized smart farming the EU generates:	
Category 1 - a higher risk for an increased North–	**Subgroup 1: Disadvantageous situation in West Africa** Price differences Lack of capital Lack of competitiveness Low market share High cost of production

South divide	Feed import **Subgroup 2: Advantageous situation due to subsidies in EU** Trade distorting agricultural subsidies Taking the local advantage of Africa Abolition of subsidies in the EU
Category 2 - no higher risk for an increased North–South divide	**Subgroup 1: Advantageous efficiency increase with smart farming** Need of importation Imported products for the poor **Subgroup 2: Irrelevance of subsidies for smart farming in EU** No competition with imported products Irrelevance of subsidies of the imported poultry

Figute3: Gouping of the codes in the categories and subgroups

The paper analyses the two categories with the subgroups by using two tools: 1. Evaluating the amount of the respondents who mentioned the codes and 2. a qualitative analyze.

3. SCALED QUALITATIVE ANALYZE

In this scaled analysis part, the paper defines the meaning of the codes and gives an overview of the amount of mentions with an interpretation regarding the research question. Furthermore, this analyze cites and interprets striking statements of the respondents.

3.1 CATEGORY 1: A HIGHER RISK FOR AN INCREASED NORTH–SOUTH DIVIDE

Subgroup 1: Disadvantageous situation in West Africa

Code	Meaning	Hypothesis
Price differences	The respondents name price differences between the local produced products and the imported products from the EU.	The agricultural subsidies in the EU cause overproduction. That is why exports from the EU to West Africa are cheap and the local producers cannot compete. Digital farming implies the danger of even more overproduction.
Lack of competitiveness	The respondents perceive a lack of	West African producers are already not competitive with

	competitiveness with the imported products.	their products. Smart farming will enlarge the lack of of competitiveness.
Low market share	The respondents indicate a very low market share for the local production.	Due to the lack of competitiveness with the imports many local producers gave up and the market share decreased. Smart farming can reinforce the low market share.
West Africa as a dumping ground	The respondents describe that the EU sees West Africa as a "dumping ground" to get rid of remaining stock.	Smart farming can produce more overproduction the EU will use West Africa even more as a "dumping ground".
Lack of capital	The respondents complain about little possibilities to receive capital to improve and expand the production.	Due to the agricultural subsidies the producers in the EU have an advantage and can invest in expansion and improvement and in the area of smart farming.
High cost of production	West African farmers must face high cost for their local production because costs for production resources are high and an expensive electricity cost.	The cost of production is compared with the production prices in the EU already relatively high. Smart farming will reinforce the divide between the production cost in the EU and west Africa.
Feed import	The respondents explain that they are dependent on the import of feed for their production of poultry and fish.	West African farmers are in the danger of being more dependent on feed imports in their production if smart farming reduces the prices for feed in the EU.

Figure4: Definition of the codes in sugroup "Disadvantageous situation in West Africa"

- **PRICE DIFFERENCES, LACK OF COMPETITIVENESS AND LOW MARKET SHARE**

Figure 5 shows that with 50.7% nearly half of all respondents see price differences between the imported and the local produced products. The price differences are especially relevant for Ghanaian respondents with 68.8% and for poultry farmers with 74.2%. They describe the price differences as twice or three times as high as the local produced poultry. H9FE describes the situation drastically as"a battle between local production and imported products." (H9FE: #00:06:27-17#)In contrast, for fish farmers with 16.7% there seem to be no price differences. For the code "Lack of competitiveness" there is a similar trend that

especially Ghanaians with 62.5% and poultry farmers with 67.7% report a lack of competitiveness with imported products.B1FE uses a metaphor to describe the huge differences between West African and European producers:"Ok, so the level now is like a heavy weight champion fighting a bantamweight champion. There's no way you can win this fight." (B1FE: #00:17:00-84#)G1 classifies the price differences and the lac of competitiveness as"the burning issue in the country now" (G1: #00:01:41-11#).41.2% of the experts describe price differences and a lack of competitiveness. E3 explains: "So the influence of the chicken, imported chicken has gradually killed the local, the local broiler production. The reason is that people can easily get the imported ones. They're cheaper as the again the locally produced." (E3: #00:09:35-16#)

Only 25% of the fish farmers and no milk farmers confirm that.For the fish farmers it has to do with different species of fish: The local catfish is not imported and that is why they do not report the same competition situation. Only 8.7% of all respondents talk about a low market share but 17.6% of all experts. This can be explained by another knowledge focus of the experts who have a wider view for general economic facts while farmers have a focus on practical facts like the different prices. For the poultry market they describe a market share of 10–20% in Ghana, 30–40% for Liberia and 40% for Nigeria.

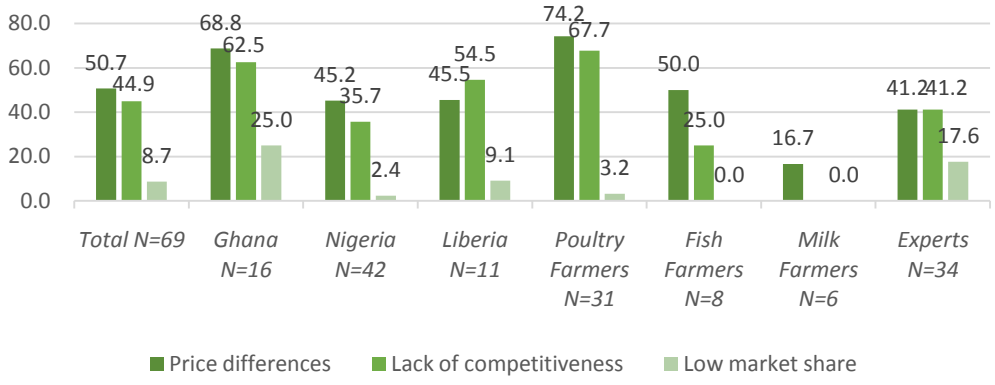


Figure5: Mentions of the codes "Price differences", "Lack of competitiveness" and "Low market share" in %

Conclusions: Smart farming will increase efficiency in the EU and reinforce overproduction. Due to the fact that most poultry farmers and many experts report price differences and a lack of competitiveness with imported poultry it can be assumed that smart farming in the EU with a higher efficiency could make the situation even worse. African market farmers will not have the possibility to compete at all because there is already a lack of competitiveness. It is possible that there will not beany market share of the local producers in most West

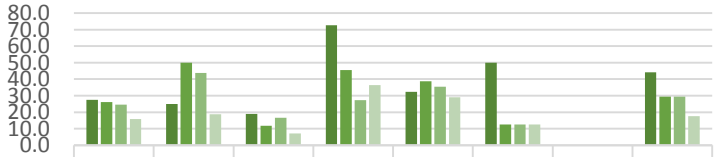
African countries. For fish farmers in West Africa it is not possible to conclude the impact of smart farming because the opinion on price differences is divided.Smart farming has maybe no negative impact if the EU focuses on other fish species than the produced ones in Nigeria.In the case of milk farmers,it must be considered that only six milk farmers in Nigeria had an interview. Most of them do not report price differences or a lack of competitiveness and that is why smart farming in milk production has maybe no negative impact on the milk sector in Nigeria.

- **FEED IMPORT, HIGH COST OF PRODUCTION, LACK OF CAPITAL AND WEST AFRICA AS A DUMPING GROUND**

Figure 6 shows that with 27.5% many respondents report the problem of feed import. In this case it is interesting that especially Liberian respondents with 72.7%, fish farmers with 50% and experts with 44.1% are mentioning this code. H7FE explains: "**That** is the problem. That is the problem. **Feed** is a major problem. Feed is a major problem. I don't want to say we are lazy, but I don't understand we have all these green vegetation all around and the main, themain ingredients for the feed is the corn. We are not producing it. We are not producing corn at all."(H7FE: #00:06:26-09#)H7F5 underlines his opinion by repetitions and emphasis. The poultry farmers do not just compete with imported poultry parts from the EU but they also depend in their local poultry production from EU's feed. The fish farmers describe the same problem: "We always start with the imported feeding because they have more nutrition than the local ones produced here. So, because of that, cost of producing is high. That's why the tail price too is high." (J6: #00:07:03-42#)J6 explains the problem with the feed import: The cost of production increases with the necessity of import and not just poultry farmers have the problem of being dependent on feed import but also fish farmers. 26.1% of all respondentsmention the resulting problem of high cost of production. Especially Ghanaian with 50% and Liberian respondents with 45.5% report high cost of production. At once, with 24.6% nearly one quarter of all respondents indicate a lack of capital. To expand the production and to reach a lower cost of production with economies of scale it would be necessary to invest. F7 explains: "Even if you go to the banks when you go to them like I went to the bank seeking for loan and the bank was telling me that I must have 50 million Naira. If I have 50 million Naira why should I go to the bank? 50 millions. It's absurd. It's absurd." (F7: #00:11:09-47#)West African farmers need to have capital to get more capital. Farmers also describe the perspective of

the banks: “Getting along from the bank this is very difficult because because of harder market it becomes risky to give a loan, yeah.” (B4: #00:05:54-22#)Therefore, it is impossible for a poultry sector dominated by small scale producers to expand and reach the status of farmers in the EU. The economy of scale is so good in the EU that farmers can focus on selling just the poultry parts that are preferred by the consumers. This is normally white meat and especially parts like the breast. That is why the farmers in the EU produce enormous masses of leftovers and it is forbidden to process it into animal flour. Local farmers in west Africa cannot afford to produce with leftovers and need to sell the poultry as a whole. This leads to high price for the local consumers. The export of leftovers is especially criticized by poultry farmers with 29%. They find harsh words for using Africa as a dumping ground: ”I think it's bad. It's inhumane. If ifit's not good for consumption in Brazil or Europe, why is it good for consumption in Africa?”(H8FE: #00:14:39-33#)

For milk farmers none of the codes applies. This can be explained by the fact that they obviously do not need to import feed for their milk production. This makes them more satisfied compared to fish farmers and especially poultry farmers.



	Total N=69	Ghana N=16	Nigeria N=42	Liberia N=11	Poultry Farmers N=31	Fish Farmers N=8	Milk Farmers N=6	Experts N=34
Feed import	27.5	25.0	19.0	72.7	32.3	50.0	0.0	44.1
High cost of production	26.1	50.0	11.9	45.5	38.7	12.5	0.0	29.4
Lack of capital	24.6	43.8	16.7	27.3	35.5	12.5	0.0	29.4
West Africa as a dumping ground	15.9	18.8	7.1	36.4	29.0	12.5	0.0	17.6

Figure 6: Mentions of the codes „Feed import”, “High cost of production”, “Lack of capital” and “West Africa as a dumping ground” in %

CONCLUSIONS: The analyze showed that poultry and fish farmers do not just have to compete with imported poultry parts but they are also dependent on feed import for their local production. The dependence on imports leads to high cost of productionThe EU seems to have already a monopoly in the worldwide feed market. Smart farming will increase the efficiency also in husbandry and

therefore the EU can amplify this monopoly by applying smart farming. At the same time, West African farmers report that they do not have access to capital whereas farmers in the EU have easy access to capital. Due to the safe income with agricultural subsidies banks in the EU do not have a high risk to offer capital to farmers. In contrast, West African farmers are excluded of the possibility of investing in smart farming if they do not have already a lot of capital. The agricultural subsidies give the farmers in the EU an advantage to implement smart farming and to strengthen their current leading position. In addition, smart farming can lead to a higher necessity of using West Afrika as a dumping ground to sell leftovers. The West African farmers can become more frustrated and the North–South divide can be expanded. Especially this feeling of frustration which is already mentioned by many respondents can lead to a North–South divide not just economic aspects but also in the aspect of social cohesion. A perception of unfair conditions that is already existing can become more relevant with smart farming. In fact, West African farmers have hardly access to smart farming and must live with the negative consequences.

3.2Category 1: A higher risk for an increased North–South divide

Subgroup 2: Advantageous situation due to subsidies in EU

Code	Meaning	Hypothesis
Trade distorting agricultural subsidies	The respondents perceive a distorting impact of the agricultural subsidies in the EU.	Due to the agricultural subsidies the respondents name a distorting and a negative impact for them.
Taking the local advantage of Africa	Due to the agricultural subsidies the respondents perceive a loss of the advantage of location.	Due to the import of products that the West African farmers also produce locally they report the loss of the advantages of location in West Africa.Smart farming can increase the loss of advantage of location.
Abolition of subsidies in the EU	Poultry farmers see a positive impact of an abolition of agricultural subsidies	The abolition of subsidies in the EUcould create a common playing field without additional advantages for EU farmers.

	in the EU.	Without agricultural subsidies it will be more difficult to install smart farming.

- **Trade distorting agricultural subsidies, Taking the local advantage of Africa, Abolition of subsidies in the EU**

Figure 7 shows that with 32.4% especially experts and with 31.3% Ghanaian respondents mention the trade distorting impact of agricultural subsidies. B1 and H4 talk about a "playing ground" (see B1: #00:12:05-71#) or a "playing field" (see H4: #00:06:29-36#)that is distorted by agricultural subsidies. Especially Ghanaian respondents with 25%complain about a consequential loss of the local advantage.The respondents assess agriculture as the most important sector for West Africa with the highest job potential and a local advantage: „The only thing that we can do and do it effectively is the farming. So if the farming is taken out from the people you want to make the people unemployed. And unemployment always brings crimes and other unwanted changes in the society." (B10FE: #00:08:38-24#) B10FE sees the agricultural subsidies and the loss of the local advantage as a reason for internal challenges like employment but also criminality.

Nigerian respondents are maybe with 11.9% less critical about the subsidies because their government installed a ban for the import of poultry meat. They are still affected by imported poultry parts from the EU because many illegal pathways in neighboring countries offer the possibility to bring in poultry parts illegally. This can be also indicated by the highest market share of local poultry in Nigeria with 40% compared with 10–20% in Ghana and 30–40% in Liberia.

Consequently, 15.9% of the respondence see the abolition of agricultural subsidies as a contribution to improve the economic situation for farmers. Especially Ghanaian respondents with 31.3% and Liberian respondents with 27.3% underline the positive impact for them if agricultural subsidies are abolished. B7 explains: "I think if it is abolished in Europe for all your farmers then their cost of production will raise a bit. […]. Then they have to compete with our prices here. Then it will help our farmers automatically." (B7: #00:10:36-29#)

Compared with farmers the experts mention the three codes often. This can be explained by a knowledge about the agricultural policies in the EU while farmers report auf the experiences in their personal life. Neither fish farmers nor milk

farmers mention the three codes. This is an interesting insight to see the huge difference between the product sectors. Even though fish farmers report a negative impact on them due to the necessity of feed import they do not see a connection to agricultural subsidies.

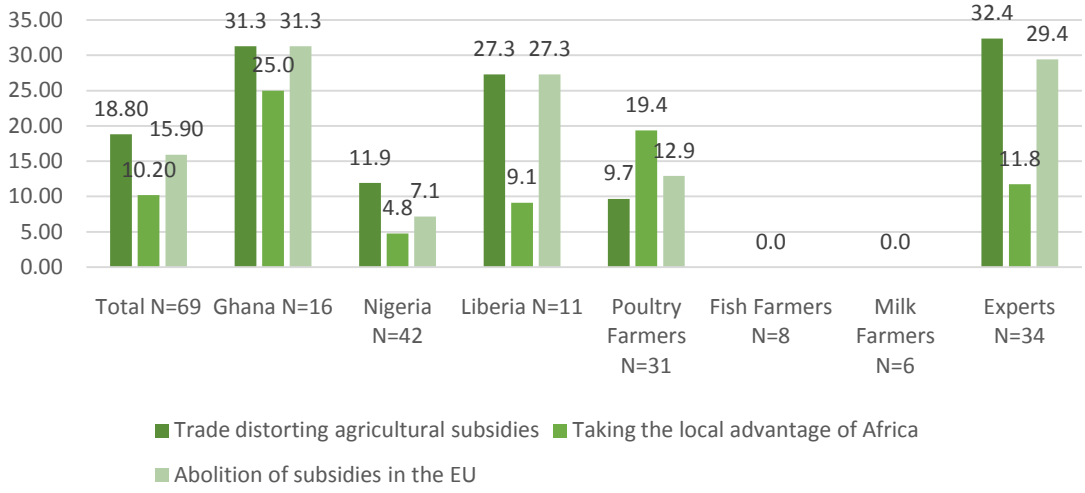


Figure7: Mentions of the codes "Trade distorting agricultural subsidies", "Taking the local advantage of Africa" and "Absolition of subdies in the EU" in %

CONCLUSIONS: The respondents reported a distortion of the trade caused by the agricultural subsidies. Subsidized smart farming has the danger of creating additional distortions. Furthermore, it could cut out the important sector of agriculture totally. In this case, it can lead to an increased unemployment and criminality in West Africa. Even though respondents access the abolition of subsidies as positive for especially poultry farmers it cannot be guaranteed that smart farming would not be installed in the EU. The abolition of agricultural subsidies would rather contribute to a retarded implementation because it would be more difficult to receive capital without the security of agricultural subsidies for farmers in the EU.

3.3 Category 2:No higher risk for an increased North–South divide

Subgroup 1: Advantageous efficiency increase with smart farming

Code	Meaning	Hypothesis
Need of importation	The respondents report the necessity of the import because the local production cannot cover the demand.	Smart farming is not a danger but rather advantageous for the meeting of the local demand.
Imported products	Positive attitude about	Smart farming can improve

for the poor	the imported productssince the poor population gets access to cheap food.	the current function of the imports to offer payable food to the poor population.

- **Need of importation, Imported products for the poor**

In figure 8 milk farmers fall out in their mentions of "Need of importation" with 83.3%. Experts are also mentioning the code relatively often with 35.3%.Milk farmers describe the milk powder import in positive words:"[T]he production level of our indigenous cattle in Nigeria is very low. Then, we still depend on importation of milk, so it's not a challenge for us. It's not a challenge to me personally, because we cannot even meet the demand in the country, so importation is not a challenge." (M6: #00:02:24-24#) M6 states that there is a necessity of milk powder importation and otherwise not all Nigerians would have access to milk. Since the local milk producers focus on fresh milk their product differs from the milk powder. Therefore, they maybe do not see the the milk powder import as a competition but as an additional possibility for consumers. Milk farmers see limited possibilities to expand their amount of production because West African cows give less milk and during the hot season, they produce just a very small amount of milk. Most of the experts who mention the code are talking about milk powder: Five of the seven experts who mention the code refer to milk powder und just two to poultry. They are also appreciating the import and access it as an important element of nutrition for children: "Milk is strategic to the growth of our children in Africa, to brain formation and the health and well-being of the rural people in Africa. And milk is very very expensive. Very, very expensive." (D1: #00:15:29-08#) Fish farmers mention with 25% more often the code "Imported products for the poor". They see their local fish as a local specialty and the imported fish acts as an offer for Nigerians who cannot afford the local catfish: "The only thing that is on my head is rich people eat catfish. […] So there are some low-class people that may not be able to afford the catfish." (J5: #00:09:09-22#)J2 clarifies that the imported fish is used by "oriental halls" and "eateries". (see J2: #00:01:06-12#)

This shows the contrast between the two categories: Especially fish farmers and milk farmers do not see the imported products as a competition but as an additional range for consumers with different demand. Compared to poultry farmers fish farmers and milk farmers compete with an imported product that differs from the local produced catfish and fresh milk while poultry farmers

compete with the same product.

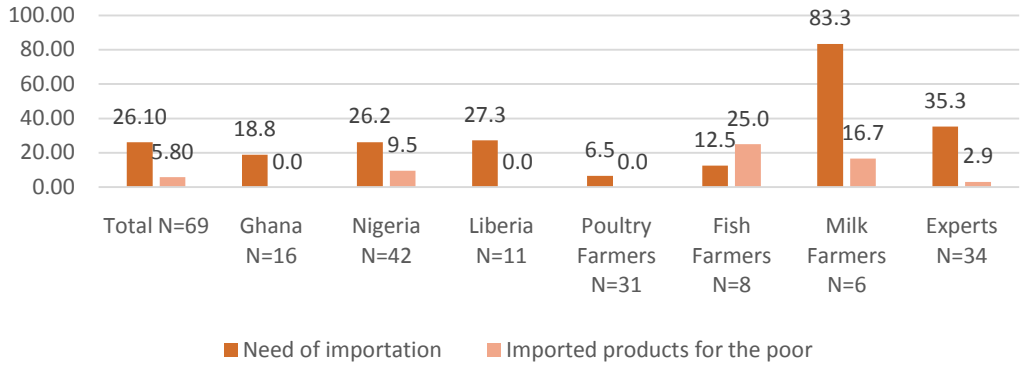


Figure 8: Mentions of the codes "Need of importation" and "Imported products for the poor" in %

Conclusions: The conclusions from category 1 refer especially to the product poultry. For imported fish and milk powder smart farming can be useful. With a growing population in West Africa the demand for fish and milk will increase. Without smart farming and a higher productivity, it is maybe not possible to meet simultaneously the demand of consumers in the EU and consumers in West Africa. Therefore, smart farming can function as a safe possibility to meet the future demand. Without smart farming especially the poor population could be excluded of buying milk or fish because the local catfish and the fresh milk are not affordable for them. In the case of milk, it is currently with the lower productivity of local West African cows and the hot season not foreseeable that the local production will expand and meet the demand. Subsidized smart farming can be accessed as an important element to ensure the future supply.

3.4 Subgroup 2:Irrelevance of subsidies for smart farming in EU

Code	Meaning	Hypothesis
No competition with imported products	The respondents do not have a perception of competition with imported food.	Smart farming does not have an impact and there will not be more competition with more products on the West African market due to smart farming.
Irrelevance of subsidies of the imported poultry	The respondents do not see any connection between the agricultural subsidies and the importation of poultry.	Subsidized smart farming does not have an impact on poultry export to West Africa.

- **No competition with imported products, Irrelevance of subsidies of the imported poultry**

In figure 8 shows that especially milk farmers mention the code "No competition with imported food" with 83.3%. Fish farmers follow with 62.5% and poultry farmers do not mention the code at all. This underlines the results of the analyze of the subgroup 1 of category 2: While no poultry farmers perceive no competition with the imported food, nearly all milk farmers do not perceive such a competition. M2 describes: "That, the competition is friendly. It's not against one another. It's not affecting their own price. That, it's not affecting their own job as well." (M2: #00:05:16-7#) Interestingly,some respondents report that without subsidies there would not be a difference for the farmers in West Africa: "You're better farmers. Yes, more manageable, more advanced, you know how to do it very well, unlike here that we're just catching up. Most of us don't even know, even vaccination, all these things." (G1: #00:16:16-60#) G1 as a fish and poultry farmer states that the situation in the EU is already too advantageous and the abolition of the subsidies would not change that the farmers in the EU have more knowhow. All in all, just a few respondents mention this code. The experts with 8.8% mention the code with the argument of G1.

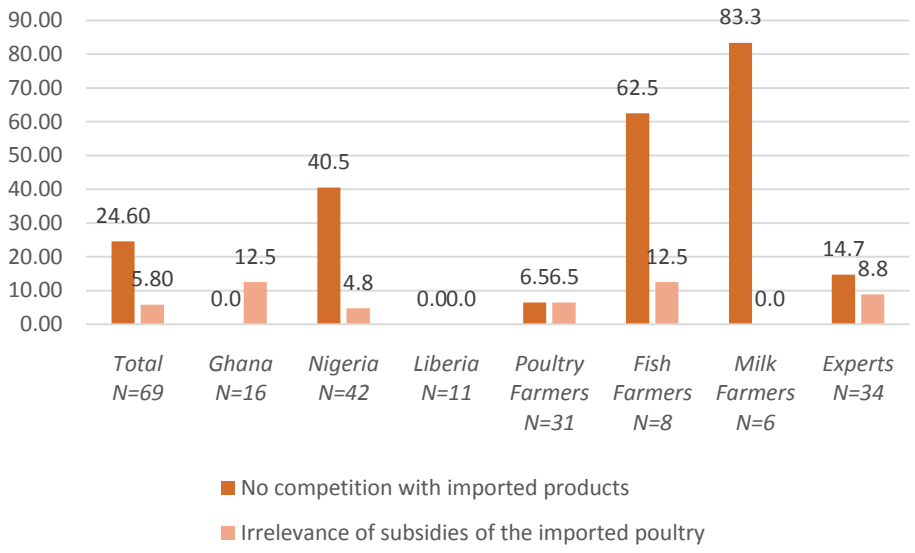


Figure8: Mentions of the codes "No competition with imported products" and "Irrelevance of subsidies of the imported poultry"

CONCLUSIONS: Even though most fish and milk farmers do not report competition with imported food most of them do not classify the agricultural subsidies as irrelevant. But this can be explained by a lack of knowledge between the farmers. The analyze shows that the codes of subgroup 2 in category 2

underline the results from subgroup 1 in category 2: Nearly all fish farmers and many fish farmers do not see a problem with subsidized smart farming because the current import of milk powder and fish is not a competition for them. Simultaneously, it cannot be assumed what fish and milk farmers would answer if smart farming would increase the overproduction and export enormously.

4. RESULTS

The Analyze showed that the impact of smart farming depends on the product sector. For poultry farmers the higher efficiency and overproduction with smart farming can be very dangerous. African market farmers will not have the possibility to compete at all because there is already a lack of competitiveness. Smart farming could distort the world market even more and lead to more unemployment. Subsidized smart farming implies the risk that the poultry farmers in West Africa are going to lose even their small market share. Fish farmers are not endangered due to the fish import. But they report that they are already dependent on feed import and have the same risk as poultry farmers to become even more dependent on the feed import with smart farming. With more efficiency in husbandry due to smart farming the EU can strengthen its position in the world feed market. Furthermore, poultry farmers report that they have a lack of capital to expand their production and cannot benefit from the economy of scale. Farmers in the EU do not have that problem because banks in the EU do not have the risk to give them capital with the cash flow of agricultural subsidies. That is why it will be easier for farmers in the EU to implement smart farming and this could strengthen their current leading position. That is also why smart farming can lead to a higher necessity of using West Afrika as a dumping ground to sell leftovers. This can generate a North–South in the aspect of social cohesion. A perception of unfair conditions can become more relevant with smart farming. The abolition of agricultural subsidies would not stop smart farming but rather contribute to a retarded implementation because it would be more difficult to receive capital without the security of agricultural subsidies for farmers in the EU. For fish and especially for milk farmers smart farming is not as dangerous as for poultry farmers. On the contrary, milk farmers appreciate the import of milk powder and see it as a possibility to open the access to milk for the growing population. Especially poor parts of the West African population could benefit from smart farming and an increased import. This is just the case if the EU does not export the local produced catfish and fresh milk.

5. CRITICAL REFLECTION AND IMPLICATIONS

The results of this paper are limited due to several reasons: The paper focused just on the region West Africa and the results cannot be applied on all African countries. Furthermore, especially the products fish and milk have limited validity because the respondents were all Nigerian, and the number of respondents was much smaller compared with the number of poultry farmers from Ghana, Nigeria and Liberia. That is why the validity of the sector poultry is higher than the results from the sectors fish and milk. Another limitation is that the respondents did not directly answer the question how smart farming will impact them. This paper suggested answers. Nevertheless, the implementation of smart farming needs to involve the perspective and the impact on West Africa. In this region, countries and their economies are very vulnerable and there is a lack of reflection on the impact of smart farming. Therefore, this paper presents a first approach to tackle the perspective of West African farmers. It is not the conclusion of the paper to stop the implementation of smart farming in the EU. It could be rather a contribution to a common playing field to abolish agricultural subsidies and let the farmers in the EU work with similar conditions. Furthermore, it could be a great contribution of the EU to share knowledge and expertise about poultry farming but also about smart farming. The current status of West Africa can be an advantage in installing smart farming because there is less structures which need to be replaced with new structures of smart farming like in the EU. If smart farming is installed on a fair basis without privileges for the EU then smart farming can be an opportunity to reduce theNorth–South divide and ensure the nutrition of an increasing population. If the EU does not consider the perspective of West African farmers,the EU risks a North–South in the aspect of social cohesion. With an increased criminality and unemployment in the poultry sector farmers can search for opportunities to escape and come to the EU as refugees. That is why smart farming needs to be implemented and worked out on a global scale that involves especially small-scale farmers in poor regions like West Africa.

LITERATURE:

- Anderson, K. (2016). Agricultural Trade, Policy Reforms, and Global Food Security, New York: Palgrave Macmillan.
- Bach H., Mauser W. (2018). Sustainable Agriculture and Smart Farming. Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. *ISSI Scientific Report Series*, vol 15. Springer, Cham. https://doi.org/10.1007/978-3-319-65633-5_12
- Boysen, O., Jensen, H., Matthews, A. (2014). Impact of EU agricultural policy on developing countries: A Uganda case study, in: *Journal of Internatonal Trade and Economic Development*, 25 (3), S. 377–402.
- European Commission (2019). 2019 EU Budget: growth, solidarity and security in Europe and beyond, *Press Release European Commission*, December 2018.
- Härtel, I., Ren, D. (2018). Handbook of Agri-Food Law in China, Germany, European Union, Cham: Springer.
- Mayring, P. (2015). Qualitative Inhaltsanalyse, Weinheim: Beltz Verlag.
- Rose D. S., Chilvers J. (2018). Agriculture 4.0: Broadening Responsible Innovation in an Era of Smart Farming. *Frontiers in Sustainable Food Syst*ems, 2(87).
- Shamshiri R., Weltzien C., Hameed I. A., Yule I. J., Grift T. E., Balasundram S. K., et al. (2018). Research and development in agricultural robotics: A perspective of digital farming, *International Journal on Agriculture and Biological Engineering*, 11(4), 1–14.
- Wolfert, J., Sørensen C. G., GoenseD. (2014).A Future Internet Collaboration Platform for Safe and Healthy Food from Farm to Fork, *Global Conference (SRII), Annual SRII, IEEE, San Jose, CA, USA* (2014), pp. 266-273.
- World Bank (2020). World Bank Country and Lending Groups. Country Classification. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (last visit: 10/25/2020).