



# Surveying Illegal Access to Genetic Resources: A Case Study in Borena Zone, Southern, Ethiopia

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**Abstract:** One of the National Biodiversity Strategy and Action Plan (NBSAP) target to realize the mission of reducing pressures on biodiversity is “reduction of unsustainable utilization of biodiversity and ecosystem services”. Thus ultimately tackles and controls illicit movement of genetic resources of the country. Therefore, the objective of this study is to survey the current status, routes, impact, means, involved actors and management of illicit access to genetic resources particularly in Oromiya Regional State, Borena Zone. Data were collected from a total of 120 informants selected purposively from Moyalle District, Yabello District and Borena Zone governmental offices. Semi structured interviews, structured questionnaires; focus group discussion and document analysis were used for data collection. 75.6% of the informants reported that genetic resources are illicitly transferred from Ethiopia to Kenya followed by both Kenya and Somalia (14.3%) informants and 68% of the informants reported that genetic resources are illegally imported from Kenya followed by both Kenya and Somalia reported by (12.3%) of the informants. Merchants were the responsible actors involved (41.6%) in the illegal access to genetic resources followed by transboundary travelers (8.4%). 26.9% of the respondents reported that plants, animals and their derivatives have been illegally transferred to neighboring countries and (16.8%) of them said that animals have been illegally transferred to neighboring countries. 43.7% of the informants stated that the overall multiple impact and trend of illegal access to genetic resources in the future would become high and increased sharply respectively and 42.9% of them said that the current status and trend of illegal access to genetic resources would be intermediate and constant trend respectively. The result revealed that considerable amount of genetic resources around Borena Zone has been subjected to piracy, which will have a probability of intermediate continual impact in the countries biodiversity in the future if appropriate measures are not taken. Therefore, border checkpoints should be strengthened in human capacity and facilities to monitor whether Prior Informed Consent (PIC), Mutual Agreed Term (MAT), Multilateral System and other legal requirements of a particular permit are fulfilled and to undertake technical control. Besides, authoritative and concerned governmental Institution of the three countries (Kenya, Ethiopia and Somalia) should work cooperatively to curb out the ecological and economical effects of illegal access to genetic resources by developing and implementing further proper controlling intervention techniques.

**Keywords:** Illegal Access, Involved Actors, Genetic Resources, Prior Informed Consent and Permit

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## 1. Introduction

Before the coming in to force of Convention on Biological Diversity in 1993, biological resources are regarded as common heritage of mankind and anyone can collect and use these natural resources. For instance researchers, scientists and tourists, could simply arrive at a field site, collect samples and take them wherever they goes because living

species were regarded as the common heritage of mankind. On this line of thinking, private companies and individuals could take and use the resources without any regulatory framework and benefit sharing to the party providing the genetic resource. But, after the coming in to force of the Convention on Biological Diversity (CBD), principle of national sovereignty of Parties on genetic resources have been set in order to strengthen legitimate ownership and

protection of genetic resources from misappropriation and biopiracy. Specifically Article 15 of the Convention on Biological Diversity recognizes that the sovereign rights of states over their natural resources, as well as their authority to determine access to genetic resources subject to their national legislations [2, 3, 12].

States have the sovereign rights to regulate access to genetic resources on their territories. Users of genetic resources are obliged to share benefits from utilized resources with source countries. In order to facilitate access and benefit sharing, appropriate legislative, administrative and policy measures have to been taken by both resource and user countries. In line with the international legal framework with regard to access to genetic resources, the national legislation of Ethiopia called Access to Genetic Resources and Community Knowledge and Community Right proclamation with its implementing regulation puts a requirement of access permit before accessing genetic resource (Proclamation number 482/2006, article 11. Ethiopian Biodiversity Institute has a mandate to grant access permit. (Proclamation number 482/2006, article 27) [3, 6, 7, 8].

The main threats to biological diversity of Ethiopia are the ever increasing demand for export (both legal and illegal) market for cattle, goat, sheep and camel. The National Biodiversity Strategy and Action Plan (NBSAP 2015-2020) of Ethiopia has a mission of reducing pressures on biodiversity and ecosystems. Therefore, one of the national targets to realize the above mentioned mission of the NBSAP is reducing unsustainable utilization of biodiversity and ecosystem services [4]. Target 5 of the NBSAP ultimately focused on tackling and controlling illegal movement of genetic resources through creating awareness to the society on genetic resources access and benefit sharing legal procedures to enable utilization of the countries biodiversity in a sustainable manner.

Ethiopia is share a border with Somalia, Kenya, Sudan, Eritrea and Djibouti on various directions of the country. The

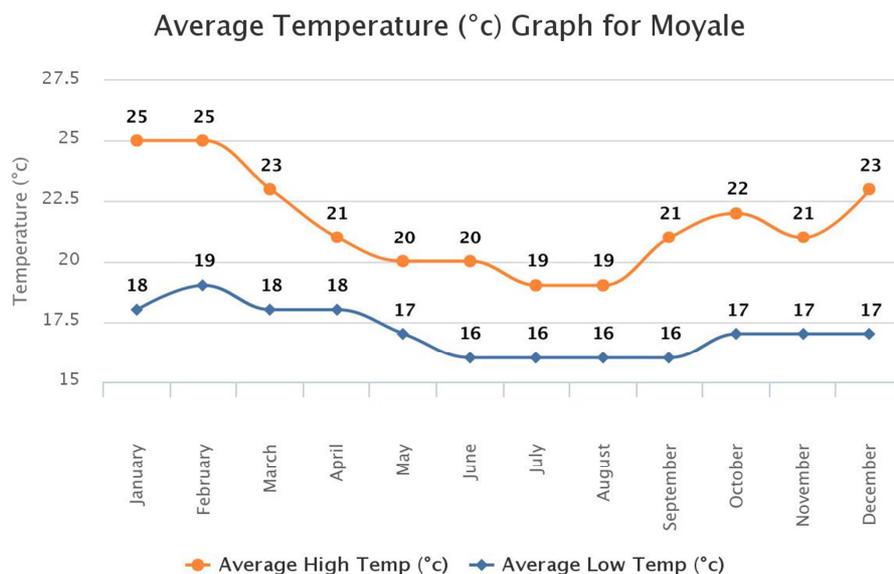
illegal movement of genetic resources along with these borders has lead to a probability of genetic misappropriation which might result in the use of intellectual property systems to legitimize the exclusive ownership and control over genetic resources and biological products that have been used by the local peoples of Ethiopia over centuries in non-industrialized cultures.

Borena Zone (Yabello and Moyalle) are the two identified districts where unauthorized/ illegal trafficking of genetic resources have been frequently observed [15]. This situation might be due to the proximity of these districts to Kenya and Somalia border although little is known on the illegal movement of genetic resources from Ethiopia to border countries. In addition the research is useful as a baseline data for future study and the effective intervention of illegal movement to genetic resources. Therefore, the present study tries to examine the status, trend, involved actors, routes, controlling mechanism, types and future suggested approach in controlling illegitimate movement of genetic resources.

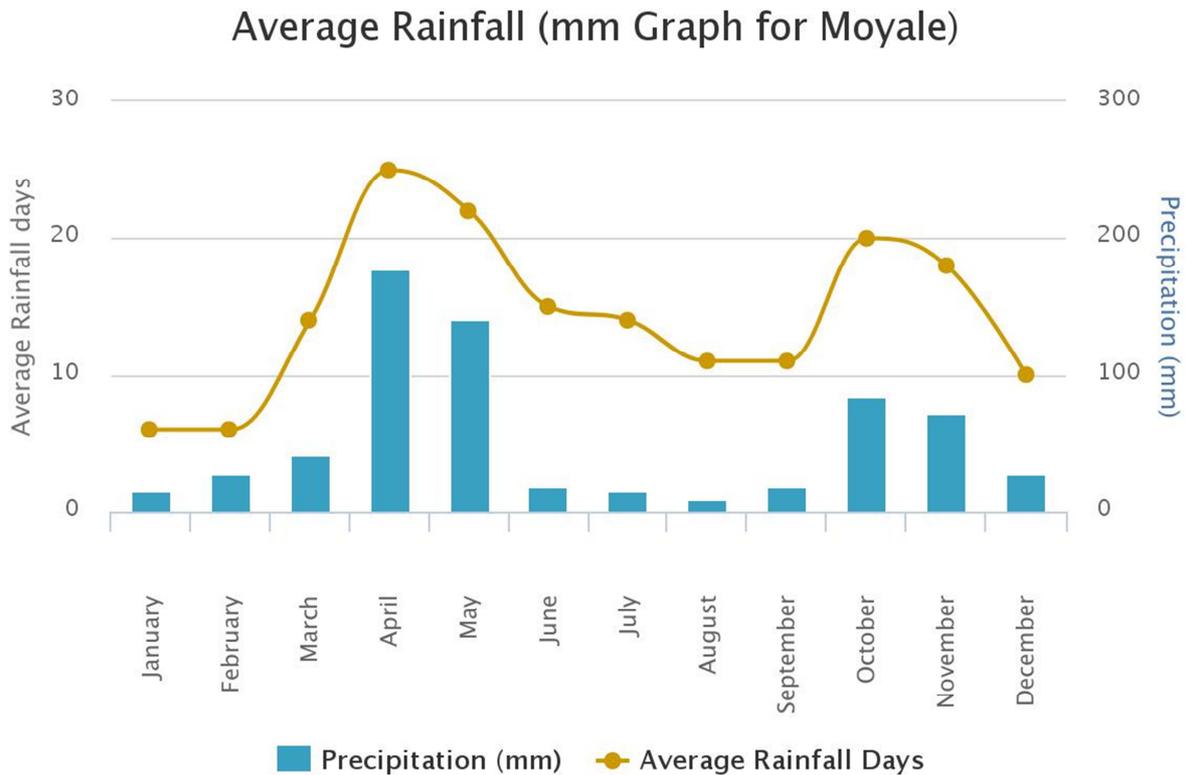
## 2. Methodology

### 2.1. Description of the Study Area

The study was conducted in Yabello and Moyalle districts. The rainfall in yabello and Moyale is bi-modal (Figure 2). There are four seasons in the year namely; the Gana-long rainy season (March-May), the Bona-dry season (December-February), Hagaya-short rainy season (September-November) and the Adolesla-cool dry season (June-August). Moyale is one of the districts bordered with Kenya. The maximum average temperature recorded is 25°C in January and the minimum average temperature recorded is 16°C from June to September (Figure 1). Whereas, Yabello has a maximum average temperature of 28°C recorded at February and the minimum average temperature is 13°C recorded at February, March, May and June [1, 11, 14]



**Figure 1.** Climatic diagram of Ethiopian Moyale (Adopted from <http://www.worldweatheronline.com>).



**Figure 2.** Average rainfall for Moyale District (Adopted from <http://www.worldweatheronline.com>).

## 2.2. Research Design

Field survey was conducted from May to June 2015 in Oromiya Regional State, Borena Zone, especially, in Yabello and Moyalle District. Data were collected on the status, route, ways of illegal trafficking and suggested management options of banned movement of genetic resources from prior selected concerned offices based on the information obtained from Borena Zone Administration. Accordingly, 21 government sectors from Yabello Zone offices and Yabello and Moyalle district offices are purposively selected based on their proximity to the issues under study. A total of 120 informants from 21 sectors were selected using purposive sampling methods based on their professional background and position. The average number of informants from each sector is around 5.5. The number of respondents was determined based on the availability and consideration of budget and time. All of the informants were subjected to structured questionnaires designed. In addition, semi-structured interview, focus group discussion and document analysis were used to exploit the remaining information on illegal movement of genetic resources across the entire Zone. The data were analyzed using SPSS software version 21 to obtain simple descriptive statistics like frequency and percent. In addition Excel software was used to sketch charts such as bar graphs and pie chart.

## 3. Result and Discussion

### 3.1. Illegally Imported Genetic Resources to Ethiopia

Significant number of informants (27%) reported that

plants, animals and their derivatives are illicitly imported to Ethiopia from neighboring countries. Whereas, the remaining, 8.4% of them reported that plants are introduced to Ethiopia and 10.1% of them reported that animals and their derivatives have been imported to Ethiopia illegally. Similarly, (10.1%) of the informants said that animals, their products and plant derivatives are imported to Ethiopia without legal procedures. 9.2% of the informants reported that animals are imported to Ethiopia. Whereas, the remaining 5.0% animal and plant derivatives, 5.0% animal, plants and plant derivatives, 6.7% animals, 4.2% others undefined things, 1.7% animals and plants and 0.8% plants and plant derivatives have been imported to Ethiopia. The other 12.6% of the informants is being deficient in having adequate information on illegally imported genetic resources to Ethiopia (Figure 3). The result showed that illegal importation of genetic resources is the most problematic issues around the study area which may result in an adverse impact on the native biodiversity of Ethiopia. On the other hand, there would be a probable numeric increase of alien species (plants, animals and micro organism) due to their intentional and unintentional illegal introduction of genetic resources from neighboring countries through different involved actors. The alien species imported illicitly may have a possibility of developing invasive behavior as a result of environmental and climatic shift. This result might due to the existence of long border between Ethiopia, Kenya and Somalia. The lack of skilled biological technician at custom check points could also attribute to the result.

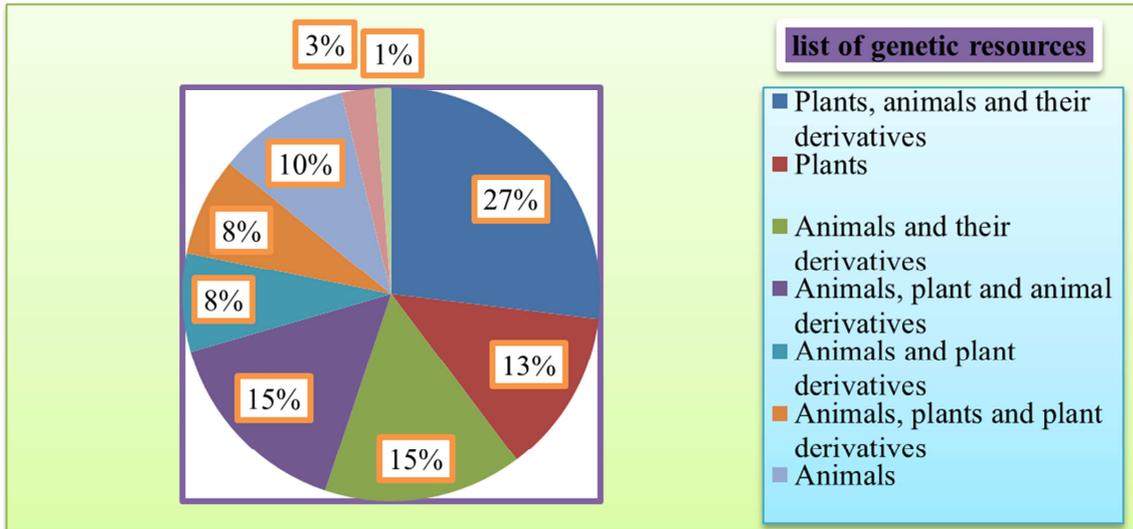


Figure 3. Illegally imported genetic resources from neighboring countries.

### 3.2. Neighboring Countries Attributed to the Import of Genetic Resources to Ethiopia

Majority of the informants (68.98%) reported that various plants, animals and their derivatives have been illegally imported from Kenya while 1.7% of them knew that plants, animals and their derivatives are imported from Somalia and 1.7% reported the genetic resources are brought to the country from Djibouti. Both Kenya and Somalia are thought by majority (14.3%) of the respondents to be the countries from which the genetic resources are imported from whereas, Kenya and Djibouti together are mentioned by 8% of the respondents as nations from which the resources are brought

from. additionally 3.4% of the respondents indicated that the genetic resources are imported from the above listed countries whereas the rest reported that the genetic resources are brought from unknown countries not listed above (Figure 4). This result revealed that Kenya and Somalia checkpoints have significantly contributed to the illegal introduction of genetic resources illegally towards Ethiopia. In addition, the long border belt existing between Ethiopia and Kenya and between Ethiopia and Somalia might be conducive to the easy transfer of genetic resources without a preconditions set by an authorized Institution.

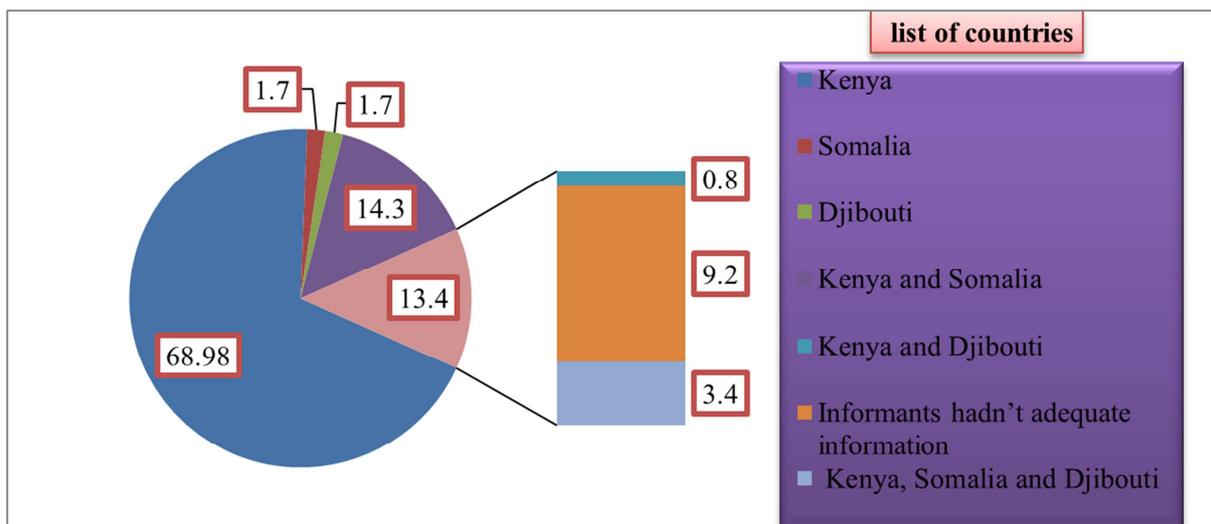


Figure 4. Contribution of neighboring countries for illegal introduction of genetic resources to Ethiopia.

### 3.3. Genetic Resources Illegally Exported from Ethiopia

26.9% of the respondents confirmed that plants, animals and their derivatives are the genetic resources illegally exported from Ethiopia. 16.8% of them indicated that animals are illegally transferred from Ethiopia. Whereas, the

remaining 10.1% of them reported that animals, plants and plant derivatives, 10.9% animals, plants and animal derivatives, 5.9% animal derivatives, 4.2% plant and their derivatives, 2.5% plants, 5.9% animals and plants, 12.6% animals and their derivatives and 4.2% other undefined

resources are being exported from Ethiopia (Figure 5). This result showed that illegal export of genetic resources is a future threat to biodiversity of Ethiopia which is in agreement with [4] explained as ‘the main threats to biological diversity of Ethiopia are the ever increasing demand for export (both legal and illegal) market for cattle,

goat, sheep and camel’. In addition the results revealed that considerable amount of genetic resources are subjected to biopiracy. Such kind of illegal transfer of genetic resources might lead to genetic resource ownership conflict between border countries.

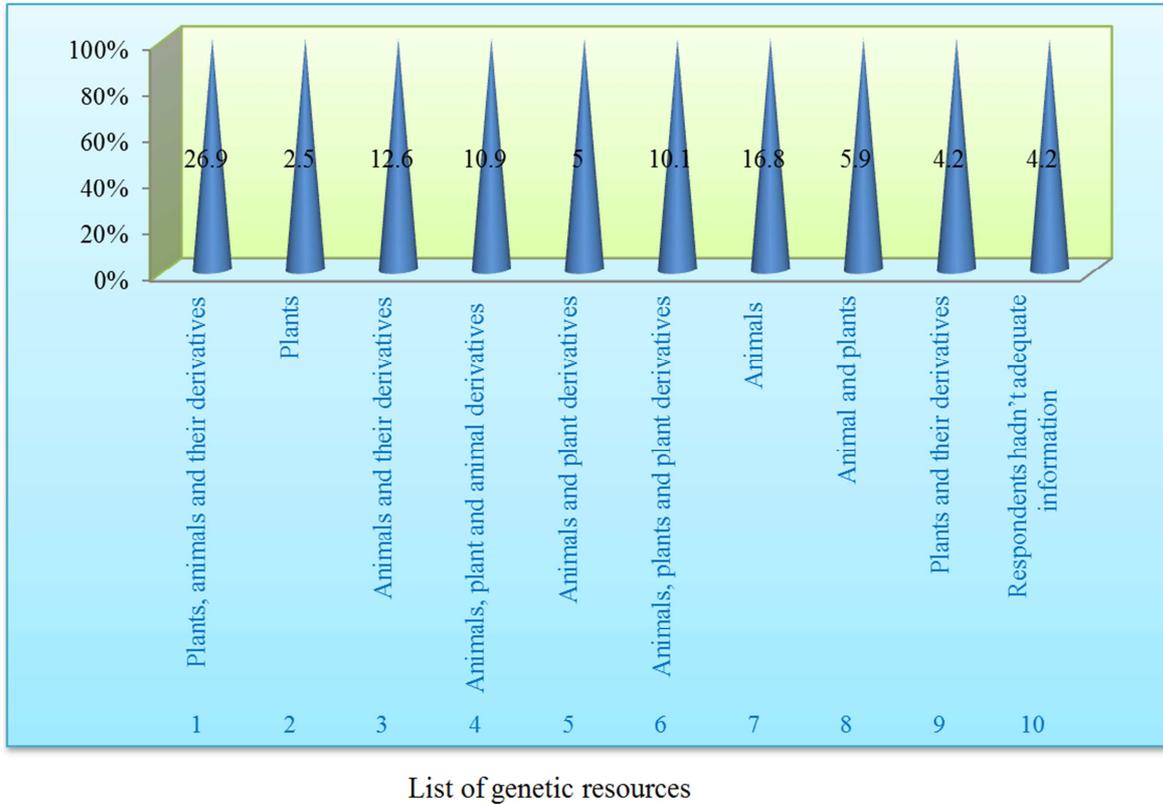


Figure 5. Genetic resources illegitimately exported from Ethiopia.

3.4. Destination Countries of Illegally Exported Genetic Resources

Majority of the informants (75.6%) confirmed that the above mentioned genetic resources and their products are being exported to Kenya While the remaining (1.7%) of them reported that Somalia and Djibouti, 12.6% both to Kenya and Somalia, 3.4% both to Kenya and Djibouti, 2.5% to Kenya, Somalia and Djibouti and 2.5% to other areas which is not mentioned are the countries as destination of Ethiopia genetic resources (Figure 6).

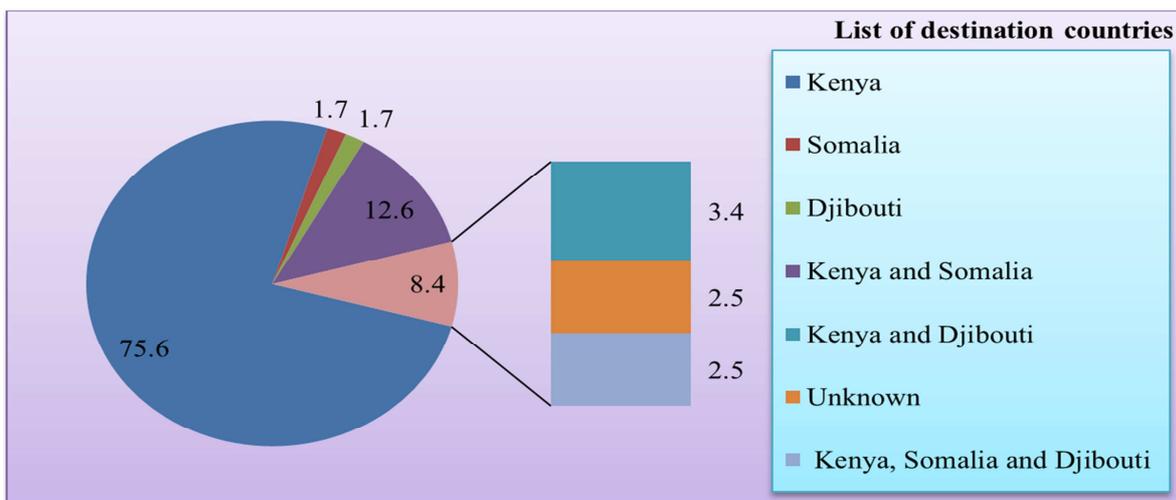


Figure 6. Countries acting as a receiver of genetic resources.

### 3.5. Suggested Bodies Accountable for Illegal Trafficking of Genetic Resources

Majority of the informants (41.2%) reported that merchants as the responsible bodies for illegal trafficking of plant and animal genetic resources while 16.0% of the informants confirmed that merchants and trans-boundary travelers as accountable bodies. The remaining informants of them reported that 10.9% merchants, pastoralist and trans-boundary travelers, 10.1% merchants and pastoralist, 8.4% trans boundary travelers, 7.6% merchants, pastoralists, trans-

boundary travelers and researchers, 1.7% pastoralists and transboundary travelers are the responsible bodies for illegal trafficking of plant and animal genetic resources (Table 1). The result indicated that merchants are main responsible bodies for illegal trafficking of genetic resources in to and out to neighboring countries. This result might be attributed to the weak enforcement of legal frameworks and problems related to knowledge, attitude and practice of the merchants to both contributors and receiver countries of genetic resources.

**Table 1.** Suggested liable bodies on illegal trafficking of biological resources.

Accountable bodies	frequency	percent	v. percent	C. percent
Merchant	49	41.2	41.9	41.9
Merchants, trans-boundary travellers, pastoralists and researchers	9	7.6	7.7	49.6
Others undefined bodies	1	.8	.9	50.4
Merchants, trans-boundary travellers, and pastoralists	13	10.9	11.1	61.5
pastoralists	1	.8	.9	62.4
Trans boundary travelers	10	8.4	8.5	70.9
Merchants and pastoralists	12	10.1	10.3	81.2
Merchants and transboundary travelers	19	16.0	16.2	97.4
Merchants and researchers	1	.8	.9	98.3
Pastoralists and transboundary travelers	2	1.7	1.7	100.0
Merchants and transboundary travelers	2	1.7	100.0	
Researchers	7	5.88		
Total	119	100.0		

### 3.6. Status of Illegal Movement of Genetic Resources

Regarding on the status and trend of genetic resource illegal movement, 43.7% of the informants said that high status with sharply increasing trend while 42.9% of them said that medium status with constant trend and the remaining (13.4%) of the respondents reported that the presence of a minimal status with slightly decreasing trend of illegal genetic resource movement (Table 2). This result indicated that there could be a probable continual impact in the future unless measures are taken.

**Table 2.** Status of illegal movement for genetic resources.

Current status and trend of illegal movement of genetic resources	Frequency	Percent	Valid Percent	Cumulative Percent
Minimal status with slightly decreasing trend	16	13.4	23.5	23.5
High status with sharply increasing trend	52	43.7	76.5	100.0
Medium status with remained constant trend	51	42.9	100.0	
Total	119	100		

### 3.7. Responsible Actors for Controlling Illegal Movement of Genetic Resources

Majority of the informants (78.2%) reported that (the community, administrative bodies, customs office, Quarantine Department and non-governmental organizations) are responsible for controlling illegal movement of biological resources. whereas only 0.8% of them confirmed that the responsible bodies for illegal movement of genetic resources are customs office, Quarantine Department, community and

administrative body while (1.7%) of the remaining informants mentioned that the administrative bodies and non-governmental organization responsible bodies for illegal movement of genetic resources. 5.9% of them recommended that the responsibility for illegal movement of genetic resources tends to be a combination of the community, administrative bodies and custom offices (Figure 7). This result showed that there should be controlling intervention approach involving different actors so as to manage the illegal movement of genetic resources around border area of Moyale and Yabello districts.

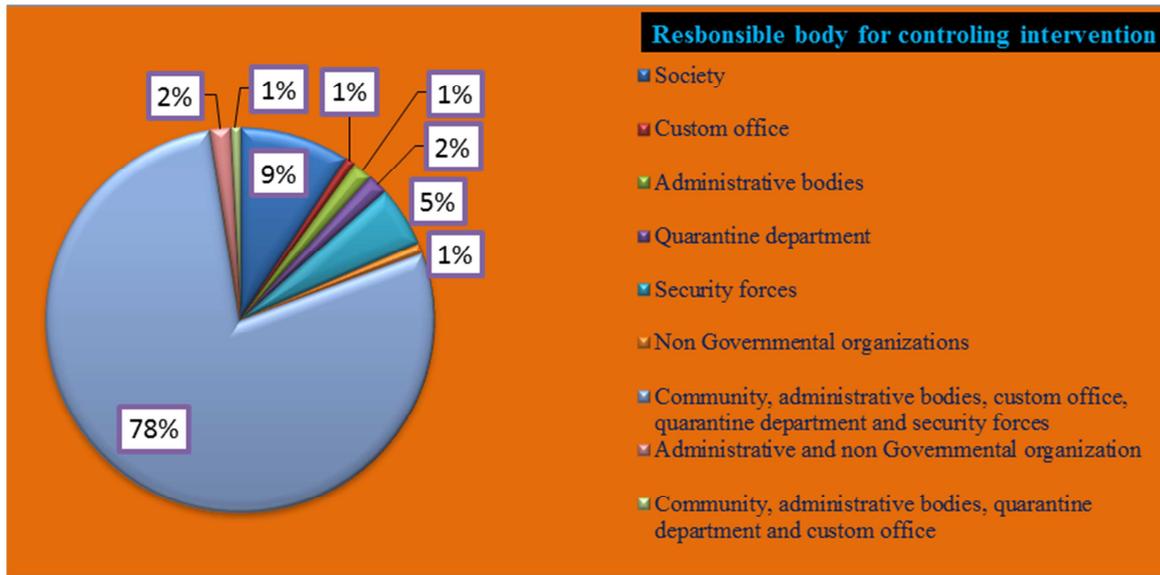


Figure 7. Actors suggested in the controlling of illegal movement of genetic resources.

**3.8. Prior Awareness on Access Permit Requirement for Genetic Resources and Associated Community Knowledge**

Almost near to half of the respondents (42.0%) confirmed that they had prior awareness on access permit requirements for the movement of genetic resources and associated community knowledge while beyond half of the respondents (58.0%) reported as had no prior knowledge about the permit. (Table 3).

Table 3. Informants' prior awareness on access permit requirement before awareness session.

Informants awareness on GR access permit	Frequency	Percent	Valid Percent	C. Percent
Informants had Prior knowledge on access permit	50	42.0	42.0	42.0
Informants had no prior Knowledge on access permit	69	58.0	58.0	100.0
Total	119	100.0	100.0	

**3.9. Prior Knowledge of Informants About the Existence of Ethiopia's Proclamation and Regulation on "Access to Genetic Resources and Community Knowledge"**

42.0% of the informants are confirmed that they had prior knowledge about the existence of the above mentioned Ethiopia's proclamation and regulation while the remaining 58.0% of the respondents reported that they had no prior knowledge on the proclamation and regulation of the country (Table 4). The result revealed that the effectiveness of

previous awareness raising activities carried out by Ethiopian Biodiversity Institute through varies medium. Thus, significant numbers of informants were reported to have information about the above mentioned proclamation and regulation of the country. However, there are still a gap clearly seen in the attitude, knowledge and practice of customers and which should be addressed to the remaining community concerning on the Access and Benefit Sharing legal frameworks.

Table 4. Prior awareness of Ethiopia's access laws in genetic resources and community knowledge.

Informants Prior knowledge on existence of proclamation and regulation of GR access	Frequency	Percent	Valid Percent	Cumulative Percent
Informants had prior knowledge	50	42.0	42.0	42.0
Informants had no prior knowledge	69	58.0	58.0	100.0
Total	119	100.0	100.0	

**3.10. Awareness of Informants on Permit Provider Institution Concerning on Access to Genetic Resource and Community Knowledge**

Out of the total respondents, 52.1% had no knowledge about the existence of permit provider Institution for genetic

resource and community knowledge. Whereas, the remaining 43.7% of the respondents were reported to have the presence of Ethiopian Biodiversity Institute as permit provider Institution whereas 1.7% of the respondents reported that the Ministry of Agriculture and Natural Resource as an authorized Institution with respect to Access permit for the

movement of genetic resource and associated community knowledge. In addition 0.8% of the respondents reported that phyto-sanitary certificate provided by quarantine department of the Ministry of Agriculture and Natural Resource and Custom and Revenue Authority as authorized Institutions which provide access permit to genetic resource and community knowledge. In addition, such a marginalized portion of the respondents (0.8%) reported that both Ethiopian Biodiversity Institute and Customs and Revenue Authority as an authorized Institutions which provide Access permit to genetic resource and associated community knowledge (Table 5). There are countries which provide access permit with varies regional authorized bureau. The result reported by [10] showed that 24 regional environmental authorities and national park system of Colombia able to issue permits for research on biological resources while in Ethiopian context the only mandated and authorized body in providing access permit for genetic and

associated community knowledge is Ethiopian Biodiversity Institute. However on the opposite of this fact, there was bureau which provide access permit such as reported by (9) as “Ethiopian Agriculture and Research Institute was not nationally mandated to provide access permit”. This result showed, there were probably different governmental offices providing access permits unintentionally or intentionally without their mandate. The result might be attributed and linked to the attitude and poor practice habit of customers to the legal frame work of the Genetic Resources and Community Knowledge and Community Rights proclamation and regulation. In addition, lack of knowledge on Genetic Resource Access and Benefit Sharing legal frames and concept of Biopiracy may attribute to the result. Such kind of illegal permit provided by unauthorized sectors may lead to the misappropriation of genetic resources of the country.

**Table 5.** Informants perception on access permit provider Institution concerning Genetic resource.

Name of institutions	Frequency	Percent	Valid Percent	Cumulative Percent
EBI	62	52.1	52.1	52.1
MoANR	51	42.9	42.9	95.0
BoANR	2	1.7	1.7	96.6
EBI and RRCA	1	.8	.8	97.5
quarantine Department	1	.8	.8	98.3
BoI	1	.8	.8	99.2
Revenue and custom Authority	1	.8	.8	100.0
Total	119	100.0	100.0	

## 4. Conclusion and Recommendation

Genetic resources illegal trafficking is a major threat to the conservation, sustainable utilization and fair and equitable benefit sharing of biological diversity. The trend of illegal movement of genetic resource and community knowledge is an alarming problem in Moyale and Yabello District of Ethiopia. Despite the uneven response, the informants reported that plants, animals, and their derivatives are imported and exported at different magnitude and amounts to and from neighboring countries. Kenya was reported to be the leading countries as destination of illegal genetic resources, followed by Somalia. Similarly, most illegal movement of genetic resources was found to be imported from Kenya followed by Somalia.

According to the present study, merchants are the principal actors involved in the illegal movement of genetic resources, followed by transboundary travelers. Though a number of informants had a prior knowledge about access permit requirement and the mandate of permit provider Institute for genetic resources and community knowledge, there are still indicators which show a gap associated with knowledge, attitude and practice of the customers. The major mechanism suggested to control the illegal traffic of genetic resources were legal penalty, strengthening

regulatory services and awareness creation sceneries. The result revealed that considerable amount of genetic resources around Borena Zone were subjected to piracy, which will have a probability of intermediate continual impact in the countries biodiversity in the future if appropriate measures will not been in place. Governmental Institution like custom office and Ethiopian Biodiversity Institute has tried to control the illegal movement of genetic resources. However, due to the mysterious nature of the illegal trafficking of genetic resources and the presence of multi routes at the border areas, the problem still remain unresolved and needs urgent solution.

Therefore, border checkpoints should be strengthens in human capacity and facilities to monitor whether Prior Informed Consent (PIC), Mutual Agreed Term (MAT), Multilateral System and other legal requirements of a particular permit are fulfilled and to undertake technical control. In addition the community, the Ethiopian Biodiversity Institute, Revenue and Custom Authority, Ministry of Agriculture and Rural Development, Ministry of Trade, Regional concerned Bureau, higher learning Institutions, judicial systems, postal offices and other organization working on ABS and related issues should participate cooperatively to curve out the effect of illegal traffic of genetic resources on Ethiopian foreign income and loss of biodiversity at large. Besides, the concerned and

relevant governmental Institution of the three countries (Kenya, Somalia and Ethiopia) should work cooperatively to alleviate the ecological and economical effect of illegal access to genetic resources by developing and implementing further proper controlling intervention techniques.

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## Acronym

EBI – Ethiopian Biodiversity Institute, MoANR- Ministry of Agriculture and Natural Resource, RCA – Revenue and Custom Authority, RRCA- Regional Revenue and Custom Authority, MoT – Ministry of Trade, BoI –Bureau of Industry, ABS – Access and Benefit Sharing, GR – Genetic Resource

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